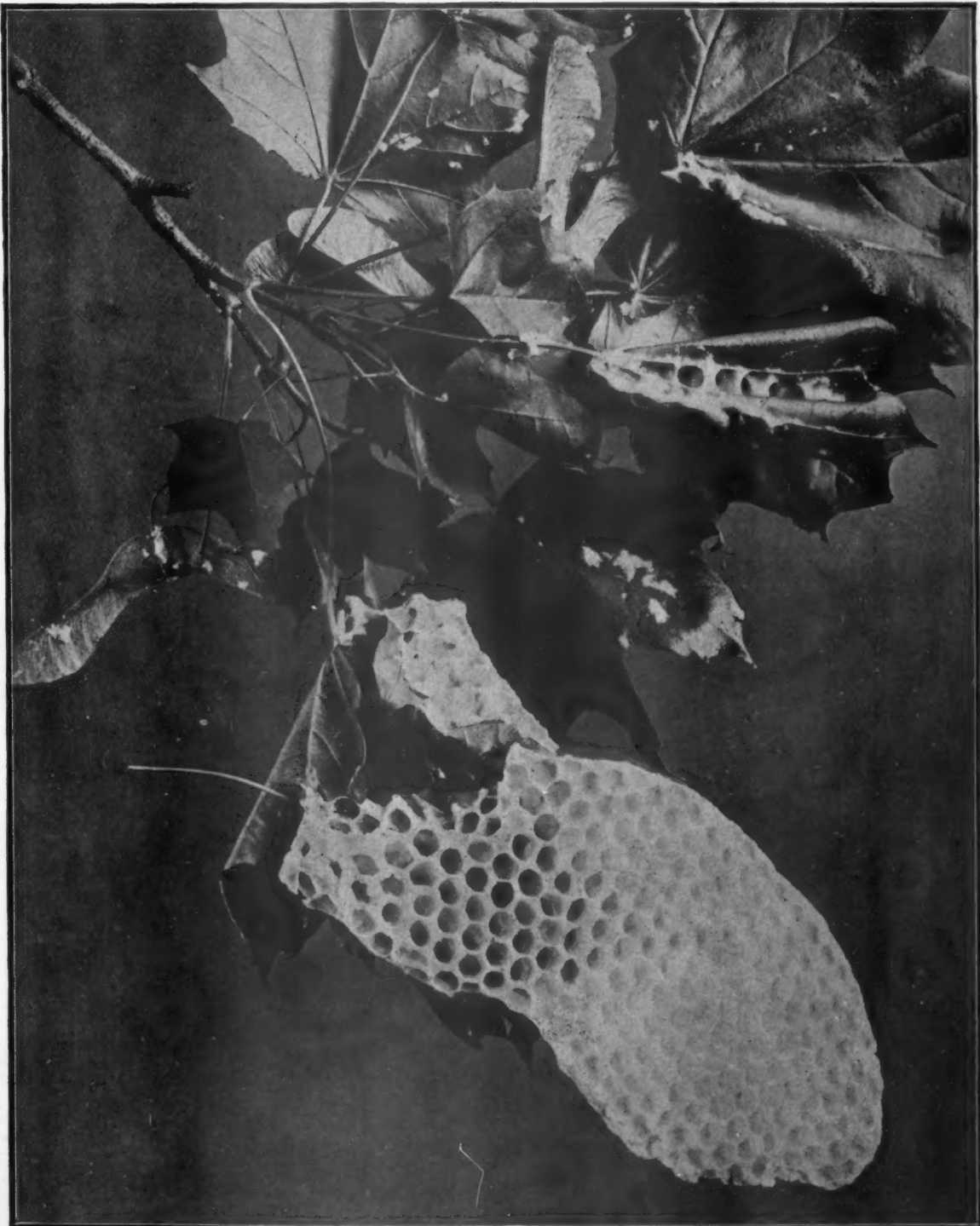


# AMERICAN BEE JOURNAL

JANUARY, 1920



**COMBS BUILT BY SWARM WHEN CLUSTERED**  
(Photo by U. S. Department of Agriculture.)

**A Happy  
Prosperous  
New Years  
To All**

**THE FRED W. MUTH CO.**  
CINCINNATI, OHIO  
"THE HONEY MEN"







"GRIGGS SAVES YOU  
FREIGHT"

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How about supplies for next season's use! Why not take advantage of the early order discounts.

SECOND HAND 60  
POUND CANS

We have a car load or more in cases of two cans, good condition at prices worth your attention.

**HONEY  
HONEY  
HONEY**

We are in the market for large quantities of all kinds of white honey. Mail samples and state price asked in first letter.

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(Supervised by Judge Chas. S. Gibson) 5152-S

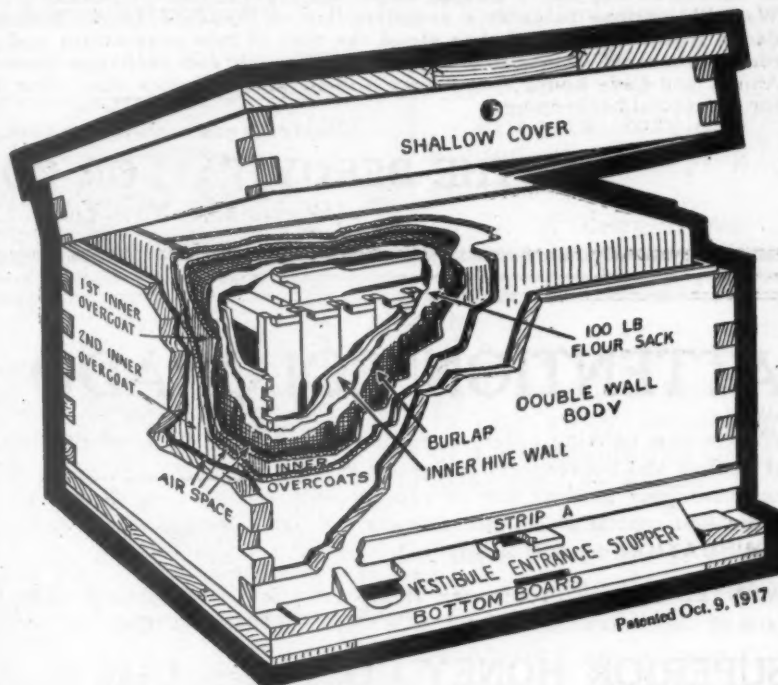
## BEE SUPPLIES

We carry a complete stock of supplies at all times, and can make prompt shipments. Our prices will interest you.

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**A. H. RUSCH & SON CO.**  
Reedsville, Wis.

## Winter Problem Solved BY THE Hive with an Inner Overcoat



### NOW FURNISHED WITH JUMBO DEPTH OR STANDARD HOFFMAN FRAMES

In January of this year, Mr. Pellett, the associate editor of the American Bee Journal, wrote us suggesting that we place on the market, Protection Hives with Jumbo depth frames. He stated that if we could furnish them with 1 1-2 inch spacing, that in his opinion we would have very nearly an ideal hive, and if he was again to engage in commercial honey production, this would be the hive that he would want. Numerous like requests from other bee keepers for this same equipment have been received.

We are now prepared to furnish Protection Hives with standard Hoffman frames the same as in the past, or standard Jumbo depth frames ten to the hive body, or those with 1 1-2 inch spacing nine frames to the hive body. The same size covers, bottoms and rims as used in the past will be supplied, the only difference will be in the depth of the hive body when Jumbo frame is wanted.

Standard single hive, comb or extracted honey supers or bodies in the 10 frame size, are regular equipment for Protection Hives.

Send for a new special circular of the Protection Hive which has just been issued.

### TIN HONEY PACKAGES

2 lb. Friction Top Cans in cases of 24. 5-lb. Friction Top Pails in cases of 12.  
3 lb. Friction Top Cans in crates of 612 5-lb. Friction Top Pails in crates of 100.  
2 1/2-lb. Friction Top Cans in cases of 24. 6-lb. Friction Top Pails in crates of 208.  
3 1/2-lb. Friction Top Cans in crates of 450. 10-lb. Friction Top Pails in cases of 6.  
10-lb. Friction Top Pails in crates of 112.

### SPECIAL PRICES

Crates of 100 five-pound pails, \$8; crates of 200 for \$15.  
Crates of 100 ten-pound pails at \$12.50. Sixty-pound cans, two in a case, at \$1.15 per case. Shipments made from Michigan, Ohio, Illinois and Maryland factories.

**A. G. WOODMAN CO.**

GRAND RAPIDS, MICH., U. S. A.

**Happy New Year to you all and many thanks for the splendid support we have received from you during the season just closed**

Now, let's look over 1920. Indications are that sugar will be higher in price, honey's most extensive competitor. So we are safe in working for a big crop of honey for 1920, and with this end in view we are organizing an Advertising Campaign to create a larger demand for honey, and in this way we have been able to handle all the honey offered us, at the highest market prices.

We will continue to carry a complete line of Standard Lewis Beeware, with its proven merits, and Dandant's Foundation, which has stood the test of two generations and no radical change needed, and we can render your old Combs and Capping at Newark and exchange your wax for Foundation or Supplies. And if you have honey to offer we will be glad to quote you. Our 1920 Bee Supply Catalog free. Yours for successful beekeeping.

Liberty Bonds accepted as cash.

**THE DERROY TAYLOR CO., Newark**  
(Wayne Co.) New York.

## ATTENTION COLORADO BEEKEEPERS

We are now booking orders at special prices for **SUPERIOR FOUNDATION** to cover the 1920 requirements of dealers and beekeepers throughout the United States. Write us the name of the dealer from whom you purchase your general line of bee supplies, stating your approximate foundation requirements. We will quote you special prices for delivery through your bee supply dealer. If he cannot furnish you **SUPERIOR FOUNDATION** we will supply you direct at wholesale prices.

**WANTED**—50 tons of beeswax at highest prices. We have recently doubled our factory in size, to take care of the heavy demand for **SUPERIOR FOUNDATION**.

**SUPERIOR HONEY CO., Ogden, Utah** (Manufacturers of Weed Process Foundation)

### QUEENS

### BEES BY THE POUND

### QUEENS

Booking orders now with one-fourth down, balance just before shipping. Two per cent discount on January orders with full remittance. We have for several seasons shipped thousands of pounds of bees all over the United States and Canada. From Wisconsin last year, when my old-time beekeeping friends heard that I had bought bees from a man in Texas, they called me a fool; but now I have more bees and more honey than any man in Green County; it is the talk in this part of the woods. (Same party has in his order again for over a thousand dollars worth for spring shipping.) From West Virginia the State Apiarist pronounced my queen one of the finest queens he ever saw. "To say that I am well pleased would put it mildly; will want more bees and queens in the spring." **Guarantee** shipment to be made on time. **Free** circular explains, also gives prices on bees by parcel post, nuclei, etc.

**Prices F. O. B. Here by Express**

1-lb. pkg. bees \$2.40, 25 or more \$2.16  
2-lb. pkg. bees \$4.25, 25 or more \$3.83  
3-lb. pkg. bees \$6.25, 25 or more \$5.62

Add price of queen when ordering bees.

**Queens**

Untested \$1.50 each, 25 or more \$1.35  
Tested \$2.50 each, 25 or more \$2.25  
Selected tested \$3.00 each

**NUECES COUNTY APIARIES, E. B. AULT, Prop., CALLEEN, TEXAS**

### Read "THE BEEKEEPER"

The only Canadian bee publication. Keeps beekeepers closely in touch with Apicultural conditions in Canada. It is the official organ of the Beekeepers' Associations for the three provinces—Ontario, Manitoba and New Brunswick. Beekeeping and horticulture are effectively combined to make a live, attractive and practical publication.

Price, postpaid, \$1 per year

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Send for a free sample copy

**The Horticultural Publishing Co., Ltd., Peterboro, Ontario**

### TELL WHAT YOU KNOW

The Western Honey Bee offers cash and other prizes in a competition (ending March 1) for articles pertaining to the work of beekeeping. Try your hand; anyone can compete, whether a subscriber to the Honey Bee or not. Send for a sample copy (free) containing particulars. Address

**WESTERN HONEY BEE**

121 Temple St., Los Angeles, Calif.



# THE LARGE HIVE

was championed and used extensively by Charles Dadant as early as 1868, and he had recognized its advantages even earlier than that.

Not satisfied with either the ten-frame of Langstroth or the eight-frame hive of the size advocated by Quinby, he experimented with different sizes and styles before adopting a hive of ten frames, Quinby size.

Some of the hives used in his experiments in large numbers were:

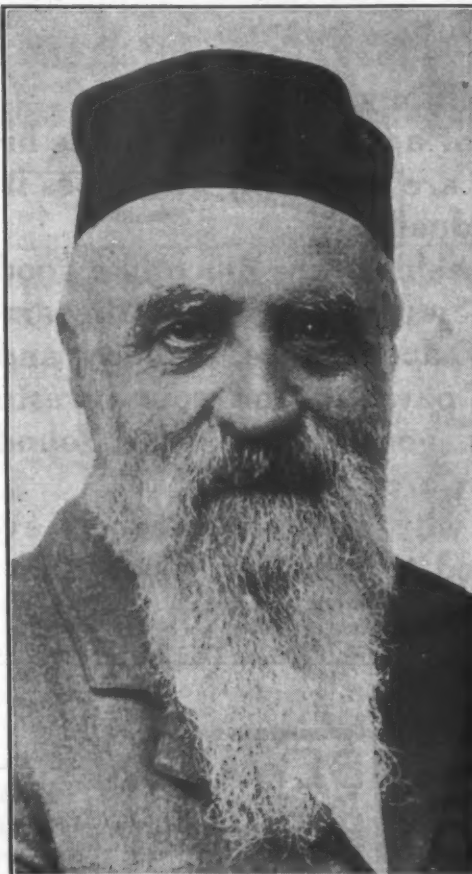
8 to 14 frame Langstroth.

8 to 16 frame Quinby.

10 to 20 frame Debeauvois with frames 12x12.

Coffin shaped hive with a circular frame.

Hives with frames 18x18 inches.



CHARLES DADANT

His ideal hive embodied the following points:

1. A deep frame to conform to the egg-laying circle of the queen.

2. A large, compact brood chamber in one story capable of accommodating the most prolific queen.

3. Ample ventilation by means of 1½ inch spacing of frames.

4. Excellent for wintering on account of the 1½ inch spacing and large amount of honey over the cluster in the deep frame.

5. Swarm control through the wide spacing and large brood chamber.

6. Shallow 6¼ inch super frames for storage.

The Original Dadant Hive he advocated and used did not adapt itself to the great amount of Langstroth equipment already in use. Moreover, it was very expensive. To remedy these two drawbacks, we have evolved and now offer

## THE MODIFIED DADANT HIVE

1. Eleven Frames, Langstroth Length, Quinby Depth.
2. 1½ inch spacing of frames for swarm control.
3. 6¼ Extracting frames.

4. Dovetailed body, regular reversible cypress bottom and metal roof cover with inner cover.
5. Langstroth equipment easily used in connection.

Our more than fifty years experience with bees in large hives convinces us that this is the hive for **extracted honey**.

If you want strong colonies, large honey crops, little swarming and good wintering, we believe this is the hive for you.

WRITE TODAY FOR DESCRIPTIVE BOOKLET AND PRICES

## DADANT & SONS, Hamilton, Illinois

# THINK OF ANY TEN PEOPLE

Of course they are all different.  
That's "Individuality".

Think of any ten makes of bee hives.  
If they are different, what does it mean?  
"Individuality".

Good beehives are much like good people.  
You know they are good for the same reasons.  
Quality, appearance, stability and the certainty to "pay out" on your investment--the features of good people--are found only in Lewis "Beeware".

That's why better beekeepers everywhere have learned to look for this trade mark on their supplies.

LOOK  
FOR



THIS  
USUAL  
MARK

The 1920 "Beeware" catalog goes out this month. It's jammed full of good things for beekeepers. Be sure and get one.  
Write us if you do not.

WE WISH YOU ALL A HAPPY NEW YEAR

**G. B. LEWIS COMPANY, WATERTOWN, WISCONSIN**  
MAKERS OF BEEWARE

BRANCHES AND DISTRIBUTORS EVERYWHERE





VOL. LX—NO. 1

HAMILTON, ILL., JANUARY, 1920

MONTHLY, \$1.00 A YEAR

## PHYSIOLOGY OF NECTAR SECRETION

By Dr. Wm. Trelease, Botanist, University of Illinois.

**W**HAT we call individual plants are complex communities of real but microscopic individuals, which biologists call cells. These are associated in numerous sub-communities, differing from one another in structure and function. Their specialization results in a division of labor and a correspondingly large total efficiency, much as specialization and division of labor lead to efficiency and productive possibilities in a nation consisting of States and these of smaller communities made up of trades, guilds and professions, which in co-operation follow the manifold activities that characterize a nation and collectively constitute the national life of its individuals, which is far more effective and greater than the individual life of any one person or class.

The active, living part of a cell is its protoplasm—the physical basis of life, as Huxley calls it—in animals and plants alike. Commonly this protoplasm encloses itself by a wall of cellulose, an organic substance manufactured by the protoplasm. Where two cells are in contact, they are usually flattened against one-another. When men first began to use the microscope, only a little over two centuries ago, it was the walls and shapes of cells that attracted attention, and the resemblance to honeycomb on a small scale was so striking that the cavities were naturally called cells.

Protoplasm itself is a very complex substance chemically, and even the much simpler cell-wall is far from being always of really one identical substance. A considerable part of the thickening of matured cell-walls has been laid down on the original partition between two cells, and not only differs from this but is not alike in different kinds of cells, and in structures like wood and cork it is impregnated with other materials that affect the cell wall very

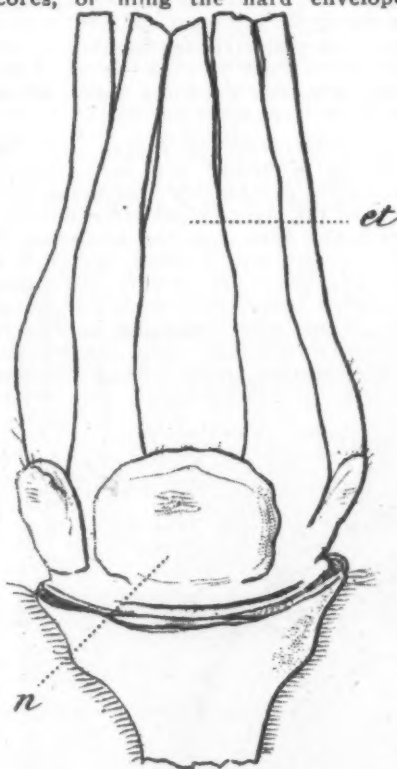
greatly in such respects as hardness and permeability to water.

The shells of nuts, for instance, are so impervious that they are commonly "stratified" by planters, so that their hard shells may disintegrate more or less as a preliminary to germination; a process that not infrequently requires more than a year unless hastened by some expedient like that of passing haw fruits through the digestive mill of poultry as a means of softening their bony cores, or filing the hard envelope,

which is a favorite trick of gardeners with the nut-like fruits of the lotus or with canna seeds. (This is similar to the scarifying of sweet clover seed.—Editor). This is the reason that several times as much clover seed—even good seed—must be used on an acre as seems necessary for securing the desired number of plants. One of these modifications is usual in the outer layers of cell walls on the surface, and it is called cuticularization. Cuticularized walls are more or less completely waterproofed. When the cells that produce nectar are at the surface, their outer walls are cuticularized in this way: when they are within the nectary and the nectar passes out through stomata, this is scarcely, if at all the case.

The greater part of nectar is water which reaches the surface from within the plant cells. To do this it must pass through walls that are little if at all cuticularized, or it must break through the cuticle. This does not mean that it must break through the entire cell wall; a small part of this is modified by the protoplasm into a gum or mucilage or some similar substance, and the water accumulates in this layer and swells it until the overlaying cuticle is burst. Some form of sugar is a frequent result of this disintegration of cellulose. Dissolved sugars pass through the ordinary cellulose wall, but they do not pass through the ordinary surface layer of protoplasm in the outer cells.

When water is separated from a solution like that of sugar by a filter of this sort, which allows water to pass, but is not permeable to the dissolved substance, the action is set up that physicists call osmosis, and water accumulates on the sides of the dissolved substance until it exercises a very considerable pressure. This osmotic action not only bursts the cuticle, when it starts beneath it,



Part of flower of *Geranium pyrenaicum*. N. nectaries; et. stamens. Greatly magnified. Copied from Bonnier's "Les Nectaires."

but results in a flow of water from within the plant, at that point.

The absorbing roots of plants show another result of this physical property, osmosis. They are not waterproofed; water is continuous through them, from the thin layer in which it occurs about particles of the soil, to the water, which composes a great part of the weight of the protoplasm within the cells. This sap of the root cells contains dissolved sugar and other osmotic substances. Osmotic absorption by the roots results in a pressure of several atmospheres. This pressure, passed from cell to cell, gives the crispness to fresh celery. Its loss, through evaporation from the leaves, results in the loss of this crispness, or wilting.

When evaporation is slight, as in a saturated atmosphere, water exudes at the surface through pores such as occur at the tip of a young grass or clover leaf. Water pores of this sort are common. They are regarded as pressure-valves by many botanists. The water that they eliminate is usually filtered by the protoplasm that it passes through, which does not allow the passage of substances dissolved in the cell sap; but some plants which grow where they absorb very "hard" water pass lime salts out through their water pores to such an extent that they are encrusted with lime as the water evaporates.

The safety-valve elimination of water under strong internal pressure and lessened normal evaporation is hardly to be called excretion or secretion; the extruded water is neither by-product nor manufactured output. The elimination of lime appears to be on the border line of excretion.

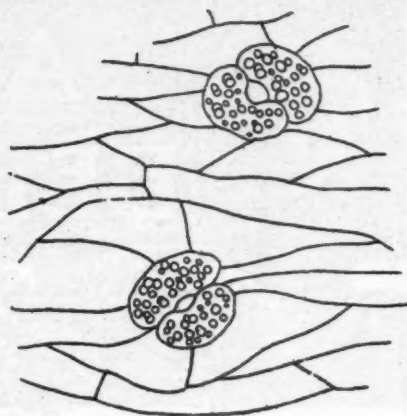
Nectar is not merely water; if it were its production would be more easily understood. To the taste it is sweet, to the sense of smell it is often fragrant; occasionally it is poisonous; often it is somewhat colored. Commonly it is very fluid, but in the nectar-cups of poinsettia it becomes very gummy. These properties come from substances—sugars, volatile oils, poisonous organic compounds—that were made by and in the plant, and they differ in different kinds of plants. Whatever bees or ants may do in changing nectar into honey, they do not entirely change or remove these substances, and the

rank brown honey of the drug store is as easily run to its source as the popular white clover honey, the daintily flavored product of western alfalfa, the aromatic acid honey of the red raspberry, or the greenish product of the sweet clover, with its delicate vanilla-like aroma, the coumarin source of which shows itself in an occasional headache, much as the minor organic constituents of some honeys derived from the heath family now and then prove seriously poisonous.

A fluid that contains these organic substances necessarily falls into the category of excretions or secretions, according as it represents waste or usable material. As either excretion or secretion, it is the product of specialized organs, glands, and its appearance marks these glands as in action or performing their function. Whatever else may be involved, this depends upon the activity of their protoplasm, or is controlled by it. When this is killed, secretion or excretion stops.

One result of the protean character of protoplasm is its different behavior in different plants, different organs of the same plant or different phases of the activity of an individual cell. In either case it can perform its functions only between certain limits of environment, and it performs them best somewhere between these limits. For each function and each condition there is what physiologists call a minimum—below which it is not carried on, a maximum—above which it has stopped, and an optimum—or most favorable. Just as in the efficient working of a human factory, power and raw materials are necessary, and workmen must be onto the job, however favorable the other conditions of manufacture may be.

The secretion of nectar and the storing of honey are consequently not quite comparable; for the activities of the honey plant are concerned with the first, and the activities of the bee are concerned in the second, though these are largely influenced by what the plant is or is not doing. This must be remembered always when comparing such records of honey storing as Mr. Strong's careful hive-weighings through a generation,



Stomata on nectariferous tissue of *Xanthoxerus sorbifolia*. Greatly magnified. Copied from Bonnier's "Les Nectaires."

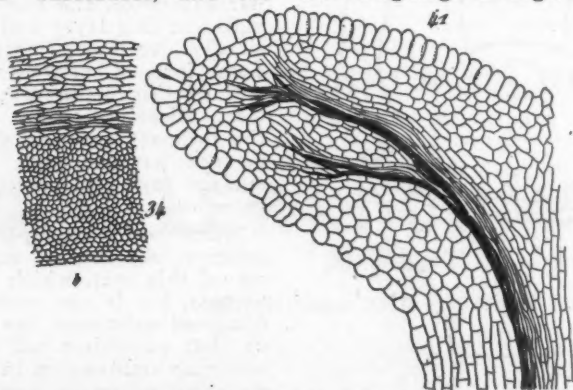
with Mr. Kenoyer's quantitative measurements of nectar secretion.

Nevertheless, the most favoring conditions of nectar secretion and honey storing agree in a number of respects. Vigorous early development of the plant puts it in condition to do its share of the work best; whatever conditions may prevail during what for most plants is a very short part of the growing season, when it is in bloom. Vigorous early development of the hive bears the same kind of relation to the final result. Early honey must be stored before the bees have reached the full strength of the season, which may have something to do with the fact that the bulk of the harvest is gleaned from plants that flower later or continue to flower for a relatively long time.

Mr. Strong's observations in Iowa show that over half of the net increase in honey storage, in southern Iowa, is made in June, and over four-fifths in June and July. These are the months when the most productive nectar plants flower, and the hives have reached the crest of their speculative activity and are undergoing division by that time.

Physiological studies show that the afternoon temperature for nectar secretion is high—between 90 and 100 degrees Fahrenheit. Observation on the hive shows that its workers are at their active best in moderately hot weather. Mr. Strong's 29-year average shows that over half of the average honey for the year is stored when the daily maximum is between 80 and 90 degrees, and nine-tenths of it is stored when the high temperature of the day is between 80 and 100 degrees. Nectar is most abundantly secreted, other conditions being equal, in warm days following cool nights; bees do not seem usually to work more actively on such days, though a record day for heather honey in England began with a frost. Damp air increases the quantity of nectar, as of the expulsion of water through water pores; but dull rainy weather lessens or stops the activity of the bees.

Nuptial nectar is secreted chiefly before or during the period of sexual



All parts of plants are composed of individual cells flattened against one another. This figure copied from Bonnier's "Les Nectaires," exhibits a longitudinal section of a stamen in *Colinsia bicolor*. Magnified.  
At left (34) cross section of filament.



maturity of the flowers. Many, like cotton, golden currant and horse-chestnut, change color as this period of sexual functioning and maximum nectar secretion passes, and bees often are quick to catch the signal. Extra nuptial nectar is secreted in greatest quantity while near-by flowers and foliage of the plant are young.

Nectar differs from time to time in quality as well as in quantity. In damp weather the increased quantity commonly causes a greater dilution of its contents of sugar, and the bees have been shown to store a greater weight of honey several days after a rainy day than immediately following it. Though the greater part of nectar is water, its essential part, for the bee-man, is sugar, chiefly a mixture of two kinds of sugar that possess a different molecular arrangement though containing the same number of carbon, hydrogen and starch atoms, which causes them to behave differently when examined by polarized light and materially affects other of their physical properties.

The flow of the water of nectar seems to be like that of water through water pores, an infiltration under pressure when root-absorption is active and leaf evaporation checked; but thoroughly and repeatedly washing the glands sometimes puts a stop to it. Beating rain does this as effectively as experimental washing. Change of position and closing in dark rainy weather characterize some flowers, and keep the rain from washing away their accumulated nectar and checking its replenishment. This was Sprengel's explanation of the fringe of hair on the petals of the wild geranium. In proportion as such nectar guards are effective, they preserve the supply and contribute to its continuance; in proportion as rain has opportunity to beat upon the nectar glands it wastes, and may even check, the production of nectar.

This stopping of nectar flow by washing away the secretion of the glands, is connected with the affinity for water of sugars. The flow of water appears to be started by the osmotic force of the disintegrated part of the walls of the secreting cells; it is stopped when the resulting substance has been removed from the outer surface of the secreting cells.

If this were all, unless the degenerating cellulose were replenished in sufficient quantity, there would hardly be such a thing as honey production. Indeed, some extranuptial glands secrete a nectar containing so little sugar that even ants may not be attracted by it, as is said to be the case with climbing smartweeds cultivated in England, though it is not usually true of such plants growing wild here where they are at home. Commonly, however, the sugar in nectar is replenished while the secretion of fluid continues.

The passage out of sugar from a living cell is very different from the es-

cape of water; the latter may result from pressure on the one hand or osmotic draft on the other, because the outer protoplasm is permeable to water but not to sugar. When sugar is secreted, this protoplasmic layer becomes to a greater or less degree permeable to the escaping sugar. This is one phase of the activity of the living protoplasm, for secretion is a vital phenomenon. What greater or less permeability of protoplasm actually consists in is a matter of theory rather than of observation, but the phenomenon is a subject of observation and experiment. Alternating warmth and cold, within limits, affect it; it has its optimum at a rather high temperature, as well as its minimum and maximum. Through an adequately permeable membrane, the flow of either water or sugar may be outwards—as it is in normal secretion, or inwards—when the secretion is absorbed—as experiments show to be true under some conditions.

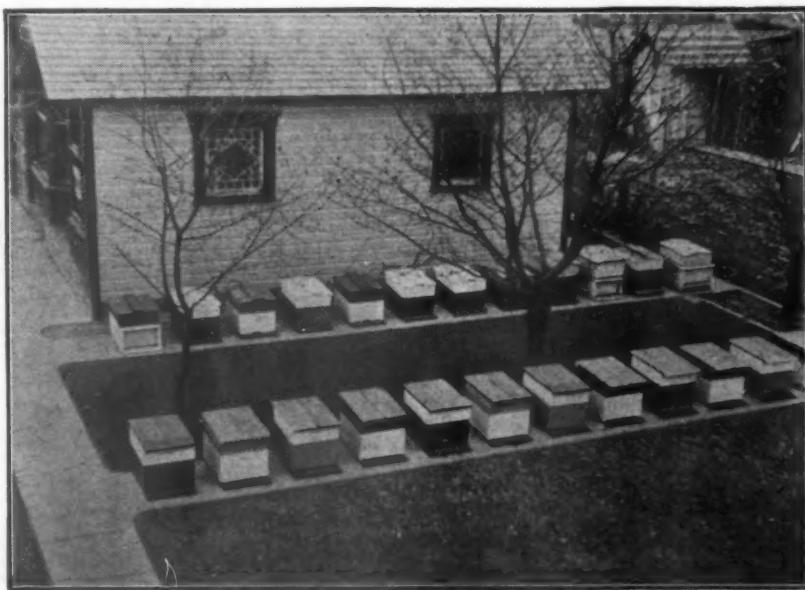
Water for nectar secretion is obtained in the first place through the roots of the plant and travels from the point of absorption to the point of secretion. Sugar for nectar secretion is manufactured within the plant, very close to the point where it is secreted. It is primarily a product of the carbon-fixing or photosynthetic activity (or in other words, assimilative activity.—Editor.) that marks green plants as the food makers of the world. Sugars appear to be among the earliest formed of such carbon-containing or organic substances in the plant; but usually they are changed into starch for storage, and this is subsequently digested or transformed into a sugar when the time of its use comes. The cells about some nectar glands are storage repositories of sugar; in other cases they accumulate a reserve of starch, as raw material, before their activities begin in supplying sugar.

Evidently, back of the nectar-pro-

duction of a given day or season, very closely related to its own optimum conditions of temperature and humidity, lies the earlier vegetation of the nectar-producing plants. Strength and vigor of growth, a good reserve of stored food from the year before, or favorable spring season, these would seem logically to affect the activity of the plant in performing this as well as others of its functions.

Kenoyer's conclusions, from Strong's honey-gathering statistics, give support to this expectation: "There is an evident alteration between good and poor years," as in ample production; "a good year has a rainfall slightly above the average, preceded by an autumn, winter and spring with more than the average precipitation," affording adequate and lasting soil moisture; "a rainy May scarcely fails to precede a good honey season," for the same reason; "a cold winter has no detrimental effect on the yield of the succeeding season, but a cold March reduces it," through preventing a fair early growth of the honey plants; "a winter of heavy snowfall, in the great majority of cases, is followed by a larger honey yield," because of its contribution to the soil moisture and the protection afforded the plants during their hibernation.

Of these conclusions, most bear directly on the conditions favorable for nectar secretion by the plants; some bear as directly on those favorable for the wintering in prime condition of the bees. Honey production rests upon both, not only in June and July and on individual days in those months of greatest honey storage, but on preceding days and months of preparation. Perhaps the suggestion may be made, even, that it goes much further back, through long centuries of selective evolution, side by side, of nectar-yielding plants and honey-storing insects, gradually coming into mutually helpful harmony.



M. D. Johnson of Webster, Iowa, uses cement walks for hive stands. Last year 102 colonies were increased to 150 and 6,500 pounds of comb honey secured.

# AMERICAN BEE JOURNAL

Established by Samuel Wagner in 1861

The oldest Bee Journal in the English language. Consolidated with The National Bee Journal in 1874.

Published monthly at Hamilton, Illinois.

Entered as second-class matter at the postoffice at Hamilton, Illinois.

**SUBSCRIPTION RATES**—In the United States and Mexico, \$1 per year; three years, \$3.50; five years, \$4. Canadian postage 15 cents, and other foreign countries 35 cents extra, per year.

All subscriptions are stopped at expiration. Date of expiration is printed on wrapper label.

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C. C. MILLER ..... Questions Department  
MAURICE G. DADANT ..... Business Manager

## THE EDITOR'S VIEWPOINT

### Nectar Secretion

The feature article in this number, by the eminent botanist, Dr. Trelease, we believe to be worthy of thorough study by every one of our readers. In order to make his description of the anatomical structure of plants more intelligible to those of our readers who have not had a college education—and they are numerous—we have borrowed three figures from a noted European work published 40 years ago, "Les Nectaires," by Bonnier, which contains 130 such cuts. It gives a definite idea of what "cells" and "nectaries" are.

### Are We Good Samaritans?

The following was received from Mr. Crepieux-Jamin, of Rouen, the former associate editor of the "Revue Internationale d'Apiculture":

"I am greatly moved by your appeal to the American beekeepers in your October number. Never has help been more greatly needed than it is at present in our northern districts. The disaster defies description; one must see to believe. For hundreds and hundreds of kilometers everything is destroyed to such an extent that in some cases it is impossible to find the exact location of a former village without a survey. It is frightful. Wherever things had been left standing after the bombardment, the Germans burned them or blew them up, cutting down the fruit trees and the shrubbery. It is a desert. The people come there with some money, but they go away discouraged. Some, however, begin to rebuild among the ruins. Some beekeepers whom I know would be glad to begin over with a colony or two. The busy hum of the bees would undoubtedly encourage them. What they hope for, is to be helped with a fresh start, the first few colonies.

"A school teacher whose apiary was destroyed was trying to rebuild it. I sent him 20 francs. He returned the

money, saying that all he wished for was a few hives of bees. But where could he secure them?

"However, the only way to rescue them is with financial help, and secure bees from away, for a start. Your generous initiative is greatly appreciated here.

J. CREPIEUX-JAMIN."

October 26.

Bees may be secured, not far away, in the Netherlands, Central and Southern France can furnish some; but there, also, the number of colonies is reduced, owing to bad seasons and the shortage of sugar. Were it not for the distance and the ocean transit, it would be advisable to send colonies from here. But there would be too much risk. Cash, queens and supplies, cash especially, is needed. Let us add to the subscription to make a gift worth while.

A commission is organized composed of the following persons:

Dr. E. F. Phillips, Washington, D. C.

Dr. C. C. Miller, Marengo, Ill.

C. P. Dadant, Hamilton, Ill.

Mr. Leon Tombu, Huy, Belgium.

Mr. Outhelin, Professor at the College of Nancy, France.

Mr. E. Perroncito, Turin, Italy.

The last named gentleman is put upon the commission membership because some help is being secured from Italy, also. It will be the duty of these parties to make proper distribution of the funds and the supplies, queens, etc., in France and Belgium.

As we cannot go there ourselves to see about the distribution, I propose that we put the American interests in charge of the Society of Friends, whose representative is on the spot. Dr. Miller agrees to this.

The list of subscriptions is as follows, up to December 8:

Previous subscriptions .....	\$331.35
F. L. Goss, Harwood, Mo.....	1.00
Edgar L. Hermance, New Haven, Conn. ....	2.00
James Maxwell, Marshfield, Wis. ....	1.00
Dr. Bonney, Buck Grove, Ia....	5.00
Jas. A. Neilson, O. A. C. Guelph Ontario .....	1.00
F. C. Pellett, Hamilton, Ill....	5.00
Mildred P. Sturdevant, Boulder, Colo. ....	2.00
Morley Pettit, Georgetown, Ontario .....	5.00
Nels Lauritsen, Clinton, Ia. --	1.00
H. Lathrop, Bridgeport, Wis....	5.00
Dr. C. C. Miller, Marengo, Ill..	5.00
C. E. Miller, Clarks, Penn.....	2.50
Thos. Clark, Hamilton City, Calif. ....	1.00



Village of Grandpre in 1913, as shown in January, 1914, American Bee Journal, when the Dadants visited there.



D. Barone, New York City	3.00
M. D. Johnson, Webster, Ia.	5.00
J. W. Stine, Burlington, R. F. D., Iowa.	2.00
E. J. Baxter, Nauvoo, Ill.	5.00
H. M. Elder, Hamilton, Ill.	5.00
W. P. Southworth, Sioux City Ia.	10.00
T. G. Lytle, Baltimore, Md.	2.00
Howard G. Pfaltzgraff, Dumont, Ia.	5.00
W. C. Kelsey, Orland, Ill.	2.00
Edw. M. Cooke, Sr., Terryville, Conn.	1.00

Total ----- \$408.85

Additions to subscriptions in supplies:

A. E. Crandall, Berlin, Conn., 12 Queens; Texas HoneyProducers' Association, San Antonio, 200 pounds foundation; Noah Bordner, Holgate, Ohio, 1 year A. B. J. and 5 pounds foundation; Chas. Boone Saunders, Meron, Ind., 10 queens; J. W. Stine, Burlington, Ia., 6 queens.

Total approximate subscribed, \$1,000.

Here is a man who is "all wool and a yard wide," or, as a Frenchman would say, "bon teint.":

"Enclosed find \$1.25, for which please send American Bee Journal for one year to some beekeeper in France or Belgium, with instructions to pass it on from one beekeeper to another, as I think they need good bee literature as much as supplies. I am also sending you 5 pounds of foundation, which please forward to the needy beekeepers of Europe.

"NOAH BORDNER, Holgate, O."

Indeed we will do as requested, and if we should be unable to find Belgian or French beekeepers who can read English, we will send the French edition of Langstroth in place of the Journal.

Perhaps we can give a good idea of present conditions over there by quoting a letter received from the village of Grandpre, already mentioned by us, which we visited in 1913, as described in American Bee Journal of September, 1913, and January, 1914. This village, in the Argonne, was often mentioned during the war, and was re-conquered by the Americans:

"At this time, November 8, there are workmen of many nationalities, in Grandpre, for they are building temporary shelters for the inhabitants. The work of rebuilding homes cannot be begun till spring.

"Our sons are still in the army. My sister lives in the Cote D'Or with her husband. As to our old cousin, he died right here under Prussian rule.

"I send you pictures of our old village. At the end of Montfle street, on the right, the American Society of Friends have fixed up a big house where they give work to the young girls. That is where our little Georgette goes to work every day. It helps a great deal, for winter is at hand. It has been snowing, and there is no other work yet. The winter bids fair to be hard; but if we keep our health, we will get along.

"MRS. CHORIN."

Come on, Boys! Let us have more.

#### Doctor Miller Improved

I am in receipt of a letter from Doctor Miller, as follows:

"I am happy to report that "Richard is himself again"—or at least in that neighborhood. I now sit up a third of the day, and yesterday went outdoors as far as the big basswood in front of the house. I am told that, with care, several years are before me, but over-exertion at any time might be fatal. I'll try to keep shy of over-exertion. But I have no feeling

that anything is wrong with me except the feeling of weakness.

"So send on your questions and I'll scratch around to find the answers.

"C. C. MILLER."

No, Doctor, we are not going to send you any Questions to answer for a while yet. We ask the readers who have questions to ask, to continue sending them to the American Bee Journal office. We are going to do our share to keep you from over-exertion.

#### L'Apicoltore Changes Its Home

Count Visconti Di Saliceto and Dr. Emilio Triaca, President and Vice President of the Italian Society of Beekeepers, make announcement, in the October number of L'Apicoltore, that after January 1, this periodical, which will enter its 53rd year of life, will be published at Reggio, Calabria, by its present editor, Dr. Vincenzo Asprea. Dr. Asprea is an experienced and a capable linguist. He is therefore amply fitted to continue the progressive course of this progressive periodical. We wish him and the old reliable magazine great success. L'Apicoltore has been published in Milan since its establishment in 1868. It gives more quotations from American bee magazines than any other publication in the world.

#### Tariff

"The writer firmly believes that this country should have a tariff of from 3 to 5 cents a pound on honey. American honey is at present confronted with foreign competition and in most cases this competing honey is of an inferior grade, produced in foreign countries where labor is cheap, and such competition is quite unfair to the beekeeping interests of America, where the best honey of the world is produced. . . ."

—The California Honey Bowl.

Almost exactly the same arguments may be read in foreign bee magazines against American honey, which they also say is of low grade and cannot be compared with their own product. Tariff is a two-edged sword. You may become convinced of the necessity of a tariff when you take only the selfish view. But when you read it in the other country's magazine, you realize how unfair such arguments are.



Montfle Street, in Grandpre, in the Argonne. The building on the right, with a roof on, was restored by the Americans and is now used as a work room for girls. The fourth or fifth house on the left, was the home of a beekeeper, Mr. Urique, in 1913, when we visited there. Mention was made of him in A. B. J. for September, 1913. He was also a candle-maker.

## Small Vs. Large Hives

By E. F. Atwater.

**T**HE testimony of reliable and extensive producers, in some localities, indicates that commercial extracted honey production may be carried on successfully without special manipulation for swarm control.

Some say that if the flow is very heavy there is so little swarming as to make an effort at its control by special manipulation unprofitable, while others with light flows, long continued or even intermittent, have but little swarming. Fortunate producers they.

But in most localities, given strong colonies, ready for the flow, and the flow materializing, slow or rapid, then the man who relies on the large hive with abundant supers of empty comb to prevent swarming, is likely to lose heavily.

In most localities it is unfortunately not true that bees with an abundance of empty comb will not swarm, in spite of Quinby, Doolittle and Dadant to the contrary.

The writer was once talking with a practical producer, than whom few have traveled more widely among the beekeepers of many States, and put the question, "Where have you found commercial producers who succeed in swarm prevention by the use of large hives and abundant empty combs, without special manipulation or control?"

The answer was, "Nowhere."

Now, let us consider the spacing of brood combs, and its influence on swarm control or prevention.

A hobby-riding craft, first we swing one way, then the other, to the great profit of the supply makers, to the doubtful benefit of the bees, and the usual detriment to our pocketbooks.

The writer has used 8-frame hives by the hundreds, with no division board, and for some years, 200 that were  $12\frac{3}{8}$  inches wide inside, giving real  $1\frac{1}{2}$ -inch spacing, and so used, excluder or no excluder, up to six stories high, they tried to swarm, as a rule.

Then we have used many 10-frame hives, as do many in central California, with only nine frames, again giving full  $1\frac{1}{2}$ -inch spacing, and note no difference in the tendency to swarm.

We have seen both spacings used, in many yards, in several States, and cannot remember one producer who was sure that the wider spacing had any appreciable influence in swarm prevention.

If there were no standard spacing, the writer might prefer the wider spacing, but as there is a standard where self-spaced frames are used (and their use is becoming almost universal) it seems that a change is inadvisable, without proof based on evidence that would be acceptable to trained scientists, that the change is really desirable.

The Dadant hive, made for 11 frames, if the writer remembers cor-

rectly, has not room for the 11 frames, spaced  $1\frac{1}{2}$  inches from center to center, and the extra space required on each side of the hive, which cannot well be less than one-quarter or one-half inch added to the  $16\frac{1}{2}$  inches required by the 11 frames, so the actual spacing is less than  $1\frac{1}{2}$  inches from center to center, unless a division board is used in place of one comb somewhat thinner than a comb, which would allow the frames to be spaced a little wider apart.

Now, in regard to hive size. Unquestionably, in most localities, bees, for best results, require large hives, very large hives.

Since the conclusive work done by Dr. Phillips and Mr. Demuth, we know that it is profitable and possible in many localities, to have 12 Langstroth frames full of brood before our flow. As space must always be allowed during spring breeding for extra stores, and as the 12 frames of brood cannot usually be had without such stores, it is apparent that a 9-frame Jumbo, as used by A. C. Miller, is quite too small, in many localities.

The 11-frame Dadant hive is none too large, so far as comb capacity is concerned, and will produce, on the average, more bees than can be had with a large brood-nest in 2 stories.

It is quite possible that the 11-frame Dadant hive is too small, during the spring breeding period.

Where it is desirable to use a large hive, with little or no spring "fussing," but abundant stores and large breeding space, the 2-story, 10-frame Langstroth is not easily excelled.

Especially would this be the case if really sufficient packing be used, and left on as late as possible, so that brood may be readily reared in both stories, in spite of the waste space of bottom-bars, beespace and top-bars, between the two stories.

Again, not only is the 10-frame hive becoming a real standard, but in the hands of the average man its combs are more likely to be free from sag, and so suitable for worker brood, than any deeper frames.

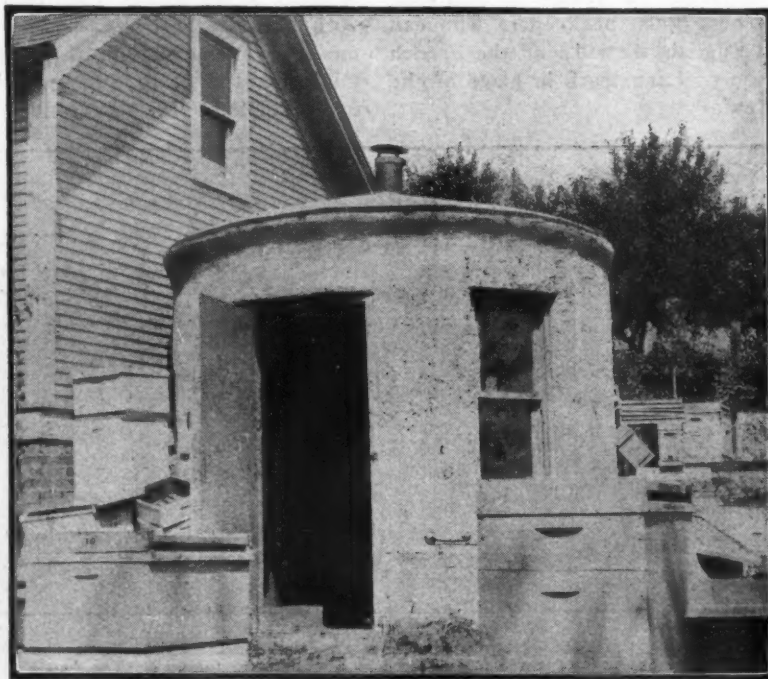
The deeper frame must have more wires, or one vertical wire, or sag renders many cells unsuitable for worker brood. Where queen excluders are used it is the writer's observation that they are no material hindrance, if very near the brood; in other words, if the capacity of the brood nest, during the flow, is such that the queen keeps it well filled with brood, but if the capacity of the brood nest is such as to leave room for much honey, after the queen has reached her peak of laying, then the excluder is a more marked hindrance. Where Jumbo or Dadant brood nests are adopted by users of the Langstroth frames, these frames will in most cases be used as supers, and the queen will too often go above, unless kept below by an excluder.

With the 6-inch combs, used by the Dadants, we know that the excluder may be quite well dispensed with.

The writer had hoped for much from the large, single-story brood-nests, but when men like J. L. Byer and F. Greiner state that they get identical, or nearly identical, results in honey from other hives, a change may be inadvisable.

Unquestionably, if a large, single-story brood nest can be used, up to the flow, without too much sacrifice of valuable points, a great saving of labor will result.

The writer is not opposed to the use of large hives, and for years past has wintered on 15 to 20 frames of standard size, but only wishes to point out some of the points to be considered, and warn against extensive, too extensive, changes until



H. C. Cook's fireproof storage house for combs in the City of Omaha.



such changes are warranted by definite, established facts.

Idaho.

We consider the above article of sufficient importance to give it a prominent place in this number. Mr. Atwater is one of the leading beekeepers of the West. His statement that, for years past, he has wintered bees on 15 to 20 frames of standard size is in the line of views expressed by the editor on "large hives."

He is also correct, we believe, in saying that swarm prevention cannot be secured by the use of large hives and abundant empty combs, ONLY. To fairly prevent swarming, "without special manipulations," we have several conditions. Young queens, few drones, large brood chambers in single stories, plenty of empty combs, spacing  $1\frac{1}{2}$  inches of frames from center to center, sufficient ventilation, shade. With all these requirements fulfilled we still have about 5 per cent of swarming. But if a beekeeper tries only a part of these requirements, or fulfils them when it is too late and the swarming fever has begun, he cannot claim to have given the method a fair chance.

There is no doubt that methods will succeed more or less according to the circumstances of the honey crop and the locality. But the following cannot be disputed:

1. Bees do not usually try to supersede young queens of 2 years or less, during the honey crop. They do often try to supersede old queens at that time, and swarming results.

2. Drones are bulky, noisy, and in the way of the bees. A large number of them makes the bees uncomfortable, and swarming may result.

3. When the queen has to pass from one story to another to seek room for egg-laying, and also if she is hindered by queen-excluders, she is more or less annoyed, therefore more willing to swarm.

4. If the bees have to build combs to store honey in large amount, they are kept idle, hanging in the hive, and the consequence is an increased desire to swarm. They are often thought to sulk, when the truth may be that they are nearly full of honey from the previous day's harvest and must wait for wax to be produced, if the crop has opened suddenly. Then swarming is sure to come.

5. The spacing of the combs  $1\frac{1}{2}$  inches from center to center gives some 180 cubic inches, more or less, of additional room in the brood chamber, over the spacing of  $1\frac{3}{8}$ , at the time when the hive is full of brood and swarming most imminent. No one can reasonably deny that the narrower spacing will induce more swarming.

6. The increase of space at the entrance to the point where all the bees can pass in and out readily is sure to make the bees more at ease and prevent swarming to some extent. It also gives chance for better ventilation and less swarming.

7. Shade, in hot localities, is important in the prevention of discomfort and therefore in helping to prevent swarming.

8. The above requirements should be fulfilled in ample time, before the swarming fever, else they are of no avail.

Mr. Atwater's statement that the 11-frame Dadant hive is none too large for brood is gratifying, for he

is, as they would say, in a monarchy, "more royalist than the king." We believe the hive large enough, and our belief is based on some 50 years of comparative trial by three generations of the family in active beekeeping.

But we hasten to agree with him, that a change from the present standards of small hives and narrow spacing may be "inadvisable," and in fact we do not urge it. Beekeepers have produced large crops and made money with small hives, and will do so still. It is a pleasure, however, for us to read that "if there were no standard spacing," Mr. Atwater "might prefer the wider spacing."—C. P. Dadant.

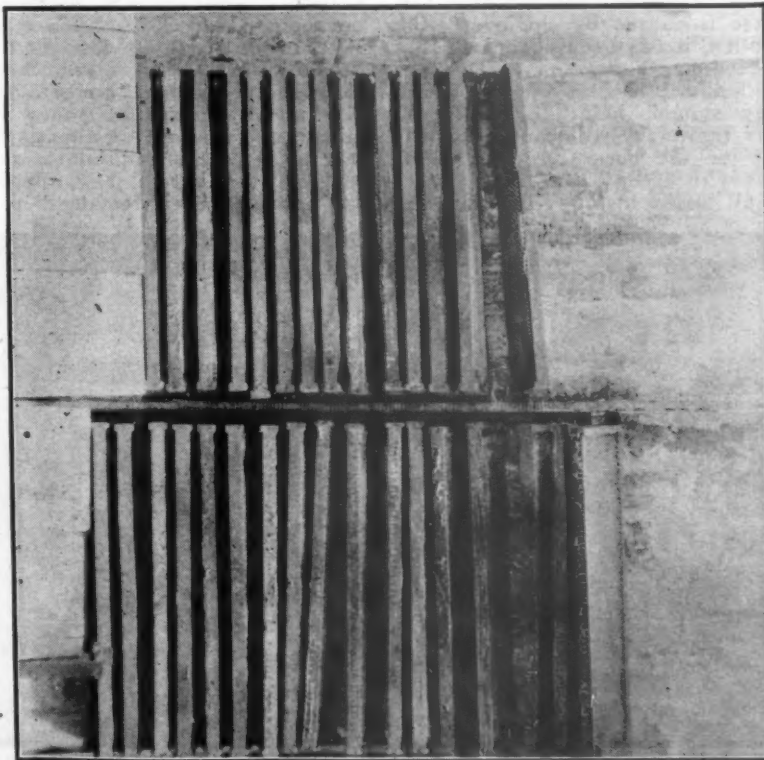
### A Fireproof Storeroom for Combs

H. C. Cook, a beekeeper in the city of Omaha, has a novel plan of caring for surplus extracting combs when not in use. The picture will give a good idea of the nature of the building. It is round and at first glance looks like a small silo. It is made of concrete and is fireproof. Since the building is tight it is an easy matter to fumigate big stacks of combs after placing them in the building to kill any moth that may be present. The building is ten feet across and ten feet high. On the walls are racks for holding the combs, as shown in the second picture. These racks hold 2,400 combs. In addition to the combs in the racks, supers filled with combs are stacked up on the floor so that the capacity of the building is ample for one apiary of about 100 colonies which he keeps on his city lot. Since Mr. Cook erected the building himself, with the help of an assistant, the cost was not large. He feels that it is an excellent investment, since all his extracting combs are thus kept safe from fire and from moths.

### The Disappearing Disease in Texas

By H. B. Parks

ABOUT the middle of August a strange and severe malady made its appearance in the bee-yards of southeast Texas. The area in which this trouble occurs extends from Travis County southeast to Live Oak County, and southwest to Dimitt County. A large number of beekeepers have reported that the disease suddenly broke out in their vicinities and that almost every apiary was affected. Those reporting coincide in their description of the disease. When first noticed the bees were rushing from the hives and most of them were unable to fly. These would crawl along the ground, seemingly in great distress, and congregate in groups. There they would move around as if in great pain until they finally died. A large number of bees, especially those newly emerged, die and fall to the floor of the hive in such numbers that they clog up the entrance. Many also report that the disease causes the death of the young larvæ. Where a hive is afflicted with



Comb racks in Cook's store house.

this trouble the emerging brood uncapped the cells, and if they have strength enough to come out they seem to be deformed and die before they have spread their wings.

A few have reported that the queen is among the first to die. Many now connect this disease with the fact that this year it has been almost impossible to keep queens in the hives. Some of the older beekeepers state that so far as they can remember, there never before has been so high a death rate among the queens.

The bees which died from this disease have a slightly swollen appearance, somewhat similar to paralysis victims. The bees are found covered with a gray fungus, or mould, in about forty hours after death. This fungus comes from all of the exposed soft parts of the bee's body, and especially from the segments of the abdomen and around the mouth parts. Whether or not this fungus has anything to do with the disease, is not known. As is customary, whenever a bee trouble appears, many are ready to suspect that the bees are suffering from poisoning. A large number of plants are suggested as being responsible for the trouble. As usual, dodder, being a plant already suspected of being poisonous, heads the list. A significant fact is that of all the plants suspected, a large percentage are heavy pollen producers. Dodder, *Cuscuta compacta* Juss. (and other varieties), and Partridge pea *Cassia Chamaecrista* L., are the only honey plants that are reported as being in bloom in the affected region. It seems very peculiar that such a thing as a plant producing nectar poisonous to bees would exist, as nature would be defeating her own purpose in having nectar secreted to attract insects, which are to act as carriers of pollen and then to have the insects killed by the nectar before they can deliver the pollen. One can hardly believe that poisonous nectar is the cause of the present trouble.

In the Journal of Economic Entomology for August, 1918, Elmer G. Carr describes a summer disease that occurred during the summer of 1917 in New Jersey, New York, Ohio and Ontario. Later the disease was reported as occurring in Mississippi and Alabama. C. P. Dadant, of the American Bee Journal, in an editorial in the December, 1918, Journal mentioned a similar occurrence in one of his own bee-yards in Illinois. Mr. Carr suggested that this malady is caused by an excess consumption of pollen, and, in his article, shows that the trouble occurred during or just after a period of stormy weather, when but a few honey plants were in bloom, and a large number of pollen plants were blooming plentifully. He further reports that the hives affected had a superabundance of pollen and an unusually small amount of unsealed honey. The theory he advances is that the bees, during the period when there is no honey-flow and an immense supply of pollen, feed too largely upon the pollen, as bees are very reluctant to consume sealed honey during this period.

The close relationship which exists between pollen and this disease becomes very apparent after one has read the article in the June, 1919, Journal of Economic Entomology by Arnold P. Sturtevant, in which he describes this disease and states that while searching for *Nosema apis* he discovered only pollen granules in the digestive organs of the dead bees. This leads him to make a number of statements, among which two are significant: "Such materials as starch and dextrin are indigestible to bees, causing what might be called acute indigestion or auto-intoxication. Therefore, the presence of so much indigestible starch in the pollen food of the bees was probably a contributory factor, if not the actual cause, of the dysentery and death of so many of the adult bees, in the particular instance cited."

Under the title "The Disappearing Disease," an editorial in September Gleanings, gives an account of the outbreak of this disease in California, Washington and Oregon, in the spring of 1917, in the Eastern States.

The conditions described by Carr, and again by Sturtevant, seem to be identical with those now existing in Texas. In sections where during average seasons there is a lack of pollen for fall brood-rearing, this year some combs are solid bee-bread. From the statements of Dadant and Carr, this disease disappears with the same rapidity with which it came, whence its name, the "Disappearing Disease," but necessarily the colonies which are dead cannot be replaced easily, and those which have been severely weakened by the death of their members will have to be handled with a great deal of care to have them retain their strength. As the best evidence indicates that this disease is caused by the overeating of pollen, it has been suggested that the feeding of sugar syrup or the breaking of the caps on the sealed honey should help materially, as either treatment will cause the majority of the bees to gorge themselves with syrup or honey.

In all of the instances cited above,

this disease occurred during the spring and summer, and between honey-flows. As the Texas outbreak has occurred during the latter half of August, some may think that these maladies are not identical. One must remember that, throughout the southern half of Texas the summer is divided into two seasons; spring and early summer compose one of these seasons. The honey plants reach the height of their blooming by the first of June; by the middle of July there are but very few flowers in bloom, and brood-rearing reaches a very low ebb. By the middle of August a change comes, by which the fall-blooming plants, which produce pollen in abundance, and strong-flavored honeys begin to bloom. With the coming of a few rains, the fall flowers bloom in abundance, and the bees again store considerable nectar. It was just at the opening of this season that the outbreak of "The Disappearing Disease" occurred; thus we have a coincidence in seasonal relationship, in the behavior of the bees, and in the condition of the hives, and every beekeeper in Texas hopes that it will also disappear quickly here.

College Station, Texas.

(We suggest that the mould or fungus mentioned in the above contribution be investigated. See translation upon this subject in the September number, page 305.—Editor.)

## How Many Trips to Fill a Cell?

By C. E. Fowler

I HIVED a swarm of bees Monday morning, 11 pounds, or about 40,000 bees (full of honey). I used three 10-frame supers of foundation, 27 cells to inch,  $4\frac{3}{8} \times 16\frac{3}{4}$  in., or about 4,000 cells to each frame—120,000 cells in all. In four days they drew all the foundation out and filled one-third full of honey (33 lbs.), allowing 10 pounds of honey for 1 pound of wax, and estimating the wax made at 1 pound, which is very low for the supers, and supposing one-half the bees remained in the



Dr. C. E. Sheldon's exhibit at the Kootenai, Idaho, fair. Dr. Sheldon at right and Miss Sheldon at left, Geo. W. York center.



hive. This is a guess from observation. Then 20,000 bees gathered 20 pounds of honey in two days, or 2,000 bees gathered one pound of honey in one day. If they made ten trips each day it would take 20,000 trips for 1 pound of honey. Then two bees filled one cell each day. The answer is, guess at the number of trips per day, then multiply by two, and you have the number of trips required to fill each cell.

If each two bees made 5 trips each day, each cell would hold 10 trips. The honey in each cell weighs as much as 5 bees.

If each bee brings one-fourth her weight in honey, then it would require 20 trips, each bee making 10 trips each day to fill one cell.

If my swarm had 20,000 field bees and each one made 10 trips, that would be 200,000 trips each day, 20,000 each hour, 333 each minute, or 5 each second.

I think this is as near as you can come to it without actually counting the bees for a whole day.

New Jersey.

### Wiring Frames

By J. E. Crane

SOMETIME last winter or early spring I wrote for the American Bee Journal in regard to wiring frames to prevent sagging.

From the number of letters received from different persons, I have come to think the subject is one of more than ordinary interest. In the brief article referred to I did not go very much into particulars, but stated in a general way that the wiring should be where the most danger of sagging came. Since that was written I have had opportunity to examine many hundreds of wired combs, I think I might truthfully say thousands, and observe the results of the many different methods of wiring. In inspection work we meet with all kinds of wiring; besides, we buy a good many bees in the spring. And then we have our own, where we changed the method of wiring as we gained experience.

We have found frames strung loosely with two wires placed near the middle of the frame. Some with three wires, the upper one perhaps 2 inches below the top bar, and so on down, about 2 inches apart. Others with 4 wires, starting 1½ inches below the top bar, while still others with 3 and 4 wires, starting from three-fourths to an inch below the top bar, those below being placed about 1½ inches apart. I have just measured a factory-made frame and find the upper hole for wiring three-fourths of an inch below the top bar, while the next is 2 inches below the first; the third one three-fourths below the second; the fourth the same distance below the third. There seems to be no fast rule for wiring, and everyone does it as seems good in his own eyes. I believe, however, most factories bore the holes so the wires will come about an equal distance apart.

We make our own frames and place

the wires where we like them, and by so doing have learned where they are most likely to prevent the sagging of the combs and the building of drone-cells.

There are conditions where ordinary wiring will not prevent sagging and an overheated hive is one of them. I had, years ago, a comb built from Van Deusen's flat bottom foundation, the wires about 1 inch apart and running up and down instead of the modern horizontal way, that became so soft from heat that it slipped through the wires and all went to the bottom of the hive; yet I was examining a comb a year ago built on this kind of foundation and wired in this way that had been in use 40 years and without a particle of sag in it; the cells near the top bar as sound and perfect as those near the bottom. Mr. Poppleton, who kept bees so successfully for many years in Florida, used a comb about one foot square, and coated the upper part of the frame of foundation with melted wax to prevent sagging instead of wiring; yet I noticed that many of those combs had settled down badly. Years ago I had a foundation mill made by Mrs. Dunham, and I made my own foundation. Four sheets for Langstroth frames would weigh a pound. I thought combs built on this foundation surely would not sag, it was so heavy; but it did, and badly, without wiring. Most extensive beekeepers have adopted the horizontal wiring of frames as the simplest way to prevent the sagging of combs and the consequent building of drone-comb, and how far from the top bar and how far apart these wires shall be is a question of much importance. I find where but two wires are used near the middle of the frame, sagging is as bad as where no wire is used. Where three, or even four, wires are used and the upper one two inches below the top bar, we are almost sure to find a streak of drone-comb an inch or an inch and a half wide above it. If the upper wire is placed one and one-half inches below the top bar I still find some sagging of the comb above it and more or less drone-comb. If the upper wire is three-fourths to one inch below the top bar and the next one below not more than one and a half inches below the first, it is rare, indeed, that we find any sagging or drone-comb built below the top bar.

We now use but three wires, and by placing them well up to the top bar we have practically no trouble. If I were using four wires I would place the upper one three-fourths of an inch below the top bar, the next one inch below the first; the third one and one-fourth inches below the second, and the fourth one and one-half inches below the third. This would leave the lower three inches of foundation without wire support, but I have never known this lower part to stretch, whether wired or without wire. We have our foundation built out quite largely in supers; that may make some difference, but a new comb weighing six or seven pounds is a pretty severe test.

### Workers or Loafers

#### A Bee's Daily Trips

By Arthur C. Miller

THE editorial in the September American Bee Journal on the "Daily Field Trips of a Worker" was of particular interest to me, as the results secured by the Holstein beekeeper so closely corroborated observations on the same subject made by me about 1905 and reported in the American Beekeeper. Shortly after, Dr. Burton N. Gates, then a student at Clark University, Worcester, Mass., to prove or disprove my findings, undertook similar observations there. The work was directly in charge of Dr. Kuhlmann. His observations showed from 4 to 8 trips a day, an average of 6. Mine had been the same. In both cases the bees were working on natural sources in the fields. When working on artificial food, either syrup or diluted honey, the results are abnormal, the bees showing a feverish haste and activity.

As to the time the bees remain in the hive between trips I found quite a variation, sometimes but a short time elapsing between trips, but usually quite a long time. The field bee often went into a cell, sometimes one containing an egg and sometimes empty, and would lie there inert for often a half hour or more. While thus "resting" the bee was very quiet, the pulsations of the abdomen often ceasing for a long time and then resumed very slowly. When such a bee "awoke" she would back hastily out of the cell, rub her forelegs over her head for all the world like a sleepy small boy rubbing his eyes, and then she would wander on, sometimes hasten over the combs and sometimes out to the fields, or else go aimlessly about the hive.

While the bee was in a cell with an egg she never touched the latter in any way. And by the way, it is not generally known that bees often, if not usually, in a heavy flow, put freshly gathered nectar in cells containing eggs, later removing it, and it in nowise interferes with the hatching of the eggs.

These observations were made in my glass hives where the cells are parallel to the plane of the glass, so that cells next to the glass have one side of glass, and all that goes on within them is readily seen.

Providence, R. I.

### New Man at Minnesota University

Mr. G. C. Matthews, of Filer, Idaho, on September 1, commenced his new duties as Assistant Professor of Bee Culture at the University Farm, taking the place vacated by L. V. France, who on July 1 began his new duties as Research Assistant in Entomology at the University Farm, his problems being to work out the responses of bees at different periods.

Mr. Matthews has been in the bee business for fifteen years on an extensive scale. Aside from being a beekeeper he is a public school teacher. He was educated in the Western Illinois Normal and the Uni-

versity of Illinois. Last year he was superintendent of schools at Camp Point, Ill.

During the winter of 1917 and 1918 he was Special Agent, U. S. Department of Bee Culture, Washington, traveling over Wisconsin and Minnesota. Mr. Matthews started beekeeping with M. A. Gill, of Colorado, with 1,000 colonies. Later he went to Utah and managed 700 colonies; he was also manager of the Superior Honey and Supply Co.

In 1912-13-14 he was in business at Idaho Falls, Idaho, from where he shipped seven carloads of bees to California, Utah and Idaho, rearing the major portion of the queens for the entire outfit. Later he established a business at Filer, Idaho, with 800 colonies that were shipped from Colorado, and has since been there and teaching school during the winter months.

### Beekeeping in Japan

By Kenneth Hawkins

Add to your problems that of such heavy rains as to prevent good honey flows in many localities and to necessitate the construction of special waterproof hive covers, and you will get a glimpse of Japanese beekeeping. These problems are explained in a most interesting letter just received from Yasuo Hiratsuka, of Tara, Gifu-Ken, Japan.

The apiary owned by Mr. Hiratsuka is located in the central part of Japan, where the bees begin breeding up by the latter part of February, in a normal season. The principal honey flow comes from "Genge," or Japanese clover, which begins blooming about April 20, and lasts until well into June. The swarming season is also coincident with this flow, as in the white clover regions of America.

In many localities there are earlier flows from rape, about April 15, which change to some extent the swarming season of the Japanese

beekeeper. According to Mr. Hiratsuka, in the mountainous portions of Japan, chestnut and persimmon are important sources of nectar, as in Virginia of our own country. He adds, however, "under normal conditions these will not do so well, because of a long rainy season at the same time." After the Japanese clover flow in his own locality, there is no other surplus flow that season, he says.

A number of labels for his honey containers, printed in English and Japanese are included with his letter. American style hives and supplies are used in Japan, says Mr. Hiratsuka, except for the covers. As shown in one of his photographs, the hive covers appear to be augmented for shedding water by roofs of matting. Flat covers are never used. He likens his season and conditions to Alabama of our own States, except for shorter flows. Much interest is expressed in beekeeping in America and in literature on American beekeeping, which has been sent to Japan.

Watertown, Wis.

### New Course at Iowa College of Agriculture

The beekeeping work at the Iowa Agricultural College is being expanded as rapidly as circumstances will permit. A new special course has recently been announced, which provides for combination work in practical beekeeping, poultry husbandry and fruit growing. Each department offers choice of a general course or a special course for a period of three months. Each course is divided into two parts of six weeks, so that the student who is unable to spend the entire three months at the college at one time, may take the first half one winter and finish the next year. The general course is repeated at the end of six weeks, while the special course continues for twelve weeks.

A correspondence course in beekeeping will be offered again this



Honey label printed in Japanese and English.

year, as usual, and arrangements are about completed for an advanced correspondence course, for those who have completed the first one.

Boys and Girls Bee Clubs will be formed in several counties in Iowa this year. It is the intention to make the club work very practical and to supervise it closely to make sure that every member understands fully the fundamental principles of practical beekeeping. Professor Paddock has not been long in his new position, but he is very active in carrying out the liberal program which the college has under way. With three men on full time in the beekeeping work at the Iowa institution, we expect to see beekeeping rapidly taking rank with other specialties there.

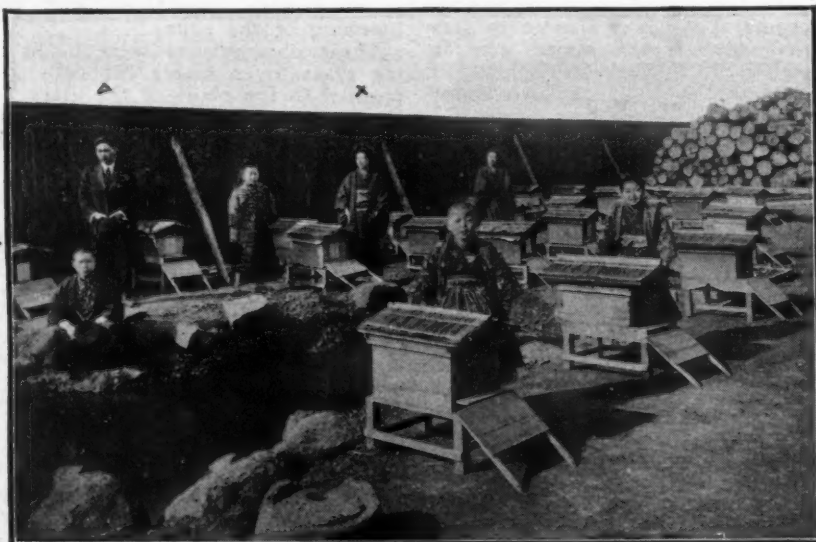
### Beekeeping in Costa Rica

W. B. Gehrels.

**A**FTER having made an extended visit to Cuba, Panama and Costa Rica the previous December and January, visiting and inspecting some important apiaries and taking general notes on bees and beekeeping, I decided to move to Costa Rica, which country I thought offered the best possibilities for the production of honey of those I had seen.

I sold all my bees in Texas excepting 8 colonies, which I reserved to bring with me, intending to buy common stock after my arrival here, using the 8 colonies as stock to breed from. Freight rates to these countries are high, and shipping space could only be had at times, and then only as a favor.

The colonies were reduced to three good frames of brood with bees, and just enough honey for the trip, filling the balance of space in each hive with empty combs. I reduced the colonies in bees and stores as a precaution against losing them by smothering, as the weather was very hot. We left Texas June 10. Two of the colonies were dead when I examined



Mrs. Hirota's apiary in northern district of Japan. Mr. Hirota is in European dress, Mrs. Hirota and others in native costumes. Note the roofs of the hives, so constructed because of rainy weather in Japan.



them on arrival in New Orleans, evidently caused by stacking other express matter over them, or leaving them in the sun.

I had each colony plainly marked in large letters, "keep out of the sun" and "do not cover the screen."

The steamship company would not accept any freight or express matter for this trip to Costa Rica, only for Panama, which made it necessary for me to store 20 cases of household goods in New Orleans, to be shipped on a later boat. But the company finally consented to take the 6 colonies of bees along for me as baggage, and I to look after them personally, which was very kind of them. I had paid them \$600 for passage money for my family and myself. The bees were placed on the deck of the steamer under a canvass that was put up to protect deck freight from the sun and rain. I watered them every day, and they fared well until we arrived at Cristobal, Canal Zone. Here the steamer tied up at the north side of a pier for 3 days to discharge 3,000 tons of cargo. The canvass that shaded the bees was cleared away. The mate gave me a small piece of canvass, and by propping this up with a few pieces of old lumber, I put up a temporary shade and moved the bees to the bow of the boat, but it was almost unbearably hot, and how any of the bees survived the three days' stay in Cristobal is a mystery to me.

Finally the ship's hold was emptied of cargo, which was a relief for several reasons; we would soon be out on the high seas again, where it was cooler, and as we passed an occasional thunder storm we did not relish living over a cargo that contained coal oil, gasoline and ammunition. Most of the passengers were also discharged at Cristobal. Mr. Pullen, United States Consular Agent to Costa Rica, also a native of our State, was the only passenger besides us that came all the way. On the following day we arrived at Limon, Costa Rica. The fringe of cocoanut palms along the beach, the white houses, the tall wireless tower of the Fruit Company, with the dark green mountains for a background, made a beautiful picture. Our steamer anchored out in the Road, and did not go up to the pier, as they had no freight for Costa Rica. The bees, mail and other baggage were lowered from the deck of the steamer to a barge by means of a large net made out of ropes.

Before leaving Cristobal I had purchased 10 pounds of cut loaf or domino sugar to feed to the bees in case they would need feeding before I could open them up at destination. This food was useful, as three of the colonies ran short of stores. I fed this sugar by dipping each cube in water and placing on the screen.

We got everything ashore and through the custom house, and took the train next morning for San Jose, shipping the bees by express. This government did not charge us any duty on the bees. The weather was not as hot here as in New Orleans,

or in Texas when we left, nor was it as hot as in Cristobal. This may have been caused by the abundant rains that were daily falling in Costa Rica. In a few hours we were in a delightfully cool climate as the train climbed up to higher altitudes through the mountains, following the winding course of the beautiful Raventazon River.

Before taking up the bees again I wish to say a few more words about the beauty of Port Limon, and the trip to San Jose, up the Raventazon valley. A person never grows tired of this trip, no matter how many times he makes it. On the night of our stay in Limon we went to the park and heard the military band play. The park is laid out with walks over-arched with many tropical vines and plants of rare beauty; flower-covered bowers shade seats where you can be comfortably seated and enjoy the music or listen to the murmuring waves of the sea, between the pieces of play. The air is laden with the fragrance of orange blossoms and other flowers near by. The royal palms of this park are the most perfect and beautiful that I have ever seen, and the plants with foliage variegated and spotted, in all the colors of the rainbow, are an admiration to all travelers.

When the train leaves Limon, it follows the sea in a northerly direction, through an avenue of cocoanut palms, as it were, for 15 miles or more, now and then stopping in a picturesque village, inhabited mostly by Jamaica negroes, who seem to be the main laborers on the banana farms. The Jamaica negro, like his cousin in the States and elsewhere, loves color, which is evident by the bright dresses the women wear. These women meet the trains with all kinds of fruits, cakes and strong-flavored peppermint candy, which they sell to passengers.

After leaving the sea coast the train plunges straight into the jungle, but not for very long; soon you pass one of the largest banana farms in the world, also some large plantings

of cacao, the tree that produces the chocolate beans. At Siquirres the train stops 30 minutes for lunch. This is a banana junction, the railroad branching into several directions to large banana districts. The extent of the banana business may be judged by the fact that they handle as many as 20 trainloads of bananas, through this junction in 24 hours, at times. After leaving this place we begin to ascend the mountains in dead earnest, and the grandest scenery greets the traveler at every turn.

We could now feel the air getting cooler all the time as the train puffed and pulled up the steep grades. I saw the bees in the express car; they were not suffering from the heat now, and seemed to enjoy the change as we did.

About 3 p. m. we reached Cartago, the old capital, which was destroyed by an earthquake six years ago. The active volcanoes, Irazu and Poas, can be seen from the car window. This is quite an important place and produces fine fruits and vegetables, and coffee. At 3:40 p. m. we were at San Jose, the present capital of Costa Rica, which was our home for a while. San Jose is a very old town. It has good hotels, fine shops and stores, and many places of interest. Both this place and Cartago have the most delightful climate and spring weather all the year round. A woolen blanket for covering at night, and an overcoat after dark are comfortable during the rainy season.

We were met at the station by a friend whose acquaintance I had made on my former visit to this country. He acted as a guide, which was not amiss to us in a strange land, among strange people, whose language we did not understand yet. Our good friend could speak English. He had a flower and vegetable farm at the outskirts of the city, where he requested us to take our bees until we could find a suitable place to get settled. We gladly accepted his offer and took the bees to his flower garden and opened them up. They had



The largest apiary in Costa Rica is under these cocoanut palms. The trees are over 75 feet high and one has more than 100 cocoanuts on it.

now been closed up for 14 days, and the way they came out was funny to watch. Some acted very stiff and were unable to fly at first. Two of the colonies proved almost dead and one was queenless; but with the help of a little feeding they all built up into strong colonies in a short time, and the queenless one reared a queen. After being opened, some brought in pollen in less than 10 minutes. There was an irrigation ditch with clear, cool mountain water a few feet from the bees. They were now in a veritable bed of flowers, but we fed them several times during the first month, as they started rearing brood heavily, and there was very little nectar. It rained most of the time, and every day.

(To be continued).

### Hunting an Apiary Location

By J. F. Diemer

**S**EPTEMBER 8th my wife and I left Liberty, Mo., in our Henry Ford for a trip through north-west Missouri, to visit beekeepers, see the country, look up some locations, and feast our eyes on the wild flowers that grow in profusion along the highway.

The first town, the first beekeeper, and the first good location, we found at Smithville. Very few bees and plenty of wild flowers and pasture land, with an abundance of native forest trees for early pollen; also considerable bottom land for fall flowers. The only beekeeper, with a dozen colonies, and his poor system, doesn't furnish enough honey for three families.

From this place we followed the Jefferson highway north and east, and along the road there seemed to be no end to Spanish needle, heart-ease and other wild flowers. Bees would do well anywhere along this trail. There is no telling the number of tons of the delicious sweets that waste for the want of beekeepers and bees to gather it.

This season was an extra good one for fall flowers. White clover does well when they have it, which is only about two years in five.

This part of Missouri is nearly all upland and excellent soil for a hundred miles; but don't compare with the splendid locations along the Grand River bottoms.

Buckwheat flour is the principal ingredient of the pancakes my wife makes for breakfast, that look so tempting and comfortable under a thin coat of 75-cent butter, and a thick coat of Spanish needle or yellow flower honey.

This yellow flower, as it is called in Daviess and other counties, is a wonder when it comes to producing not only a high grade of honey, but the main fall honey in this part of the State. There is one very serious fault with it, and that is that it does grow in Clay County, where my bees are. But, as M. G. Dadant well says, if the flowers won't come to my bees, I can load them on a truck and take them to the flowers. Some folks up here call it the little sunflower. The leaves are a little like the sunflower, but the bloom is more like the Spanish needle. It has four points or stickers on one end of the seed, and the Spanish needle has only two. (*Bidens bipinnata* L., probably.—Editor.)

Buck-brush, one of our best honey plants, blooming about July 20, is especially welcome when the white clover fails, as it did this season.

Irving E. Long, at Marcelline, told me that his scale colony gained 270 pounds between July 29 and September 20. Mr. Long is a farmer, but does not neglect his bees, and usually gets a crop if anyone does.

We stopped two days at J. F. Barton's, Coffey, Mo., while resting and eating old country ham, fried chicken, etc. I helped extract one day and we introduced 13 queens. We put in one day visiting farmers that had all the way from one to 25 colonies, all of them run for section honey, which sold for 35 cents per pound. Mr. Barton runs for extracted honey, and sold it readily for 30 cents. He can sell more honey in a short time than any beginner I ever knew. He doesn't peddle it, either; people just come in and get it. The reason was plain

enough—everybody in that whole country is Barton's friend.

From here we headed toward Bigelow, Mo. The distance, as a crow would fly, is about 100 miles, but because our Henry Ford couldn't fly, we had to go 150 miles, and because we went cross lots instead of following a well-marked trail, of course we got lost; and believe me, we had some hills to climb, half pitch and a mile long.

Once in a while we would run into a bee patch on a farm, just a few colonies with a thirty-pound rock on top of each. It is a good plan, for there would not be much weight without the rock. One little lone super for each hive; the sections looked like they had been used for nine years without starters.

Some of these beekeepers will have to unlearn a whole lot of things they know, before they can begin to learn the things they don't know, and I would like to meet the man that could get them to attend a beekeepers' meeting, clean up foulbrood, or modernize their outfit.

G. A. Conaway lives in Bigelow, and he is the principal honey producer in this part of Missouri; everything up to date, including a four-frame extractor run by electric motor. The electricity is furnished from Mound City and is used for electric lights in the homes at Bigelow. But it seemed to me that Mr. Conway used the most of them, as he had lights all over the place where he could think a light was needed. He has an outyard at the big lake five miles from home. This lake is crescent-shaped, full of fish, and a road-way runs clear around the lake a distance of ten miles. We got so interested in the lake that we almost forgot to look at the beeyard. But some of his hives were as tall as a man, and full of honey.

Mr. Conway has 55 colonies at the home place, tends to both yards himself and does most of the extracting after dark. He is agent for the Burlington Railroad at Bigelow, writes a full page each week for the county paper at Mound City, looks after other people's bees that don't know how, keeps a complete record of each colony, keeps two typewriters, one at the office and one at his residence, has a large correspondence, seldom fails to get a big crop of Conaway honey, and sells it all to the consumer direct. He has plenty of time to take in all the good shows and other social affairs, including fish fries at the big lake. While we were there I couldn't decide which he liked best—to work with his bees, or eat the good things Mrs. Conway prepared for him. He certainly is a good feeder, and a good worker, and has more time to play than most folks.

We ate breakfast at 5 o'clock. Mrs. Conway gave us a lunch that nearly filled a half bushel basket, and we started for Liberty. Arrived home the same day, feeling that our six days off were a good investment.

Missouri.



The smile that won't come off. Mr. and Mrs. Conway entertain Mr. and Mrs. Diemer.



### The Washington Short Course

In all, 118 registered for the course, many of them were from quite a distance. Fifteen counties in Washington were represented, three in north Idaho and two in Oregon. Many were there from the Cascades, and three from Vancouver, B. C.

Between 9,000 and 10,000 colonies were reported by those present, with a production of close to half a million pounds of honey for the past season.

Dr. E. F. Phillips took up the behavior of bees, beginning with the fall, and carrying them through the year to the end of the honey flow the following summer, and explained in detail the behavior of bees under favorable and unfavorable environment, and the management worked out and proven best by their experiments at Washington.

Mr. George S. Demuth followed Dr. Phillips, each session, on beekeeping practices, and in his clear, logical way gave the cream of all that their investigations have proven to be the best practices.

Mr. Sturtevant gave a perfectly wonderful course, beginning Wednesday with the Bacteriology of Bee Diseases, following up with the diagnosis and treatment. His descriptions of the brood diseases and minute detailed comparisons were so clear that it would seem almost impossible to make a mistake in the gross diagnosis at home.

Mr. Scullen, Field Agent in Washington, talked mostly on general conditions and practices in Washington and, on Friday, gave a talk on the distribution of disease, illustrated by chart. Washington beekeepers are fortunate in having such a live wire as their Field Agent.

On Wednesday evening we enjoyed a bountiful dinner at the M. E. Church, followed by a very fine lecture by Demuth on the Evolution of Beekeeping Practices.

Thursday evening we were given a rare treat by Dr. Phillips in the shape of a stereopticon lecture, "Visiting With Beekeepers." He took us all over the country, even to Porto Rico and Honolulu, and introduced us to some of the big beekeepers of the past and present, not forgetting Dr. Miller, whom we all love so dearly, though few of us ever had the pleasure of meeting him. The applause was instantaneous when he appeared upon the screen.

Beekeepers can't afford to miss this course. It is worth many times its cost to beginner or big producer, and it is worth going a long way to hear.

This is not the opinion of the writer alone, but the voice of practically every man and woman present. Such expressions as, "I wouldn't have missed it for many times the cost," and "Any single lecture is worth the trip," etc., were common.

At the close of the course a resolution was read by Dr. Harmeling, of Vashon, thanking the "Three Wise Men from the East," and also the Commercial Club for the use of the

club rooms. Then each of the instructors was presented with a little token of remembrance from the enthusiastic audience.

DR. CHARLES E. SHELDON.  
Coeur D'Alene, Idaho.

### Winter Feeding

By A. C. Miller

THIS is a problem now confronting many beekeepers, if one may judge by the numerous inquiries as to where to get sugar, and the best way to supply the food.

Don't give them syrup, now nor any other time after they have settled into their winter cluster. First, it is difficult to get the colony warmed up enough for rapid work; second, it is difficult and expensive in labor to get the whole interior of the hive sufficiently warm so the bees can store it; third, the moisture given off condenses on all cool surfaces and makes the interior of the hive damp; and fourth, and most important, it puts an extra strain on the vitality of the bees when they can least spare it.

Even if by means of hot bricks, jars of hot water, etc., the hive is so warmed that the bees break cluster and spread out as in summer, it is difficult to maintain the heat long enough to enable the bees to get all the syrup properly stored, and still more difficult to let the temperature down so slowly—a matter of days—that all the bees can get back into a cluster. Even if all this is accomplished, brood rearing is also started and will keep up indefinitely, and this in itself is most harmful to the colony.

If your bees are packed as thoroughly as advised by Dr. Phillips, you may be able to feed syrup, but at the expense of much labor to yourself and also start brood rearing.

Candy is the safest and most economical way to feed bees in cold weather. Also it is much less laborious than any system of syrup feeding. Forget all about the elaborate receipts for soft candies and make the simplest sort of hard candy, using pure granulated sugar.

Like the famous receipt for rabbit

pie, "first catch your rabbit," so first get your sugar. In most of the New England States the State Agricultural Departments are securing sugar for beekeepers, the latter writing in their requests to the Secretary of the Board of Agriculture, stating how many colonies they have, how many need food and how much sugar is needed. Unfortunately, in most cases the authorities have been so late in getting it that it is too late to feed it in the syrup form.

To make the candy, melt up the sugar with as little water as possible, just enough to keep the sugar from scorching, boil it until a little dropped into cold water chills into a hard lump, and it is done. If you are not skillful at it, get your best girl to do it for you, be she wife, sister or sweetheart. If you have neither of these, poor chap, borrow one for the occasion.

Pour the finished candy into shallow cake or bread pans, filling them to within one quarter inch of the top. Do not grease the pans, because it is desirable to have the candy stick to them. Cheap pans one-and-one-half inches deep, are excellent.

As soon as the candy is hard it is ready for use. For best results in getting the bees started on it, pour onto the surface of each cake of candy a few drops of warm honey and with the fingers, or any convenient thing, spread it over the surface of the candy. Invert one or more of the pans of candy on top of the brood frames and cover up with plenty of packing. The bees will soon cluster against the under surface of the candy and slowly lick it away. It does not create undue excitement in the bees nor start brood rearing.

The reason for leaving the candy in the pans is to prevent the access of moisture to the tops and sides of the cakes, where it would be absorbed, softening the candy and perhaps making it run down among the bees, often with fatal results. Such moisture as collects on the under surface is licked away by the bees and is an advantage.

The foregoing described candy and



The Diemers visit Conaway's apiary.

its manner of use has been tried many seasons and by many beekeepers, and has proved good. It is particularly good for use in helping out colonies which are short of stores through heavy breeding or on account of a prolonged storm in the midst of the early nectar flow.

Try it. But be careful never to scorch the candy, such can sometimes be used in late spring, but always at a risk, while in winter scorched candy or syrup is fatal.

Rhode Island.

### A Letter From Algeria

(Translated from the French)

Algiers, June, 1919.

Dear Mr. Dadant:

Our honey season is now at end, for we are in the hot days, and the bees will get nothing except in the Eucalyptus region, but this is exceptional.

The Punic bees, which I see discussed in American Bee Journal, are the bees of North Africa, very probably brought from Europe at the time when Gibraltar did not have a sea passage; or perhaps imported across the Mediterranean. They are just as described by Baldensperger in the American Bee Journal of November, 1918, page 375. Those bees are very similar to the common bees of Europe, very prolific, but very cross, and one cannot handle them without smoke. They are very vigilant and the least noise stirs them to action. The proof that they can hear is in the fact that we have been unable to pull weeds in front of the hives without causing a revolution. It would have been worse had we tried to use a hoe. They make excessive use of propolis to guard against their numerous enemies, and with the hives used here commonly they need to accumulate a great deal of it. Anything is acceptable to them, from grafting wax to half dried paint.

Your magazine is exceedingly in-

teresting and I see translations from it in . . . but their translator is like the interpreters we used to have in Algiers who belonged to one of 3 kinds: 1, the ones who knew French but not Arabian; 2, the ones who knew Arabian, but not French; 3, the ones who knew neither Arabian nor French, and yet tried to explain both. It is to be hoped they will do better. (We have mentioned this in our September editorials.—C. P. D.)

We have sent you our last Annual Report for 1919, "Nahhla". I call your attention to the deliberations of a city council which holds that bees deteriorate fruits by removing their flavor from the blossom. I had not yet seen such an argument against beekeeping.

The Lord made man in his own image and Voltaire said that man returned the compliment by making a God according to his own fancy. So Europe colonized America and it is now time for America to return the favor, by colonizing Europe and Algeria that are badly in need of suggestions and example.

My attempts at rearing the Magribine bees (see American Bee Journal, October, 1917, page 341) has not been successful. Magrib-el-aksa means "far west," so they are the bees of far west Africa.

I depended upon a friend to secure them, but through his neglect, the 4 or 5 fine queens that he secured were killed by ants. I will try it again and will send you some if I succeed, as soon as the postal facilities are again normal.

I am more and more convinced that bees do hear. But I am also satisfied that they do not readily distinguish white from the sky. I have seen bees fly against a white wall in the sunshine. (A similar experience, with photo, was given in American Bee Journal, February, 1919.)

I believe that is one reason why they are less aggressive to people dressed in light-colored clothes than

to people dressed in dark or black clothes.

The high price of honey is helping beekeeping very much. Our people have been slow to take to the use of full sheets of foundation, but one of our leading apiarists stated to me that he harvests much larger crops since he is using full sheets of it, on account of the lessening of the number of drones produced. The drones, he says, consumed a very perceptible amount of stores and our bees, in a state of nature, rear a large number of them.

Is there much larceny of bees and honey in the United States? It is a plague here. Two hives were robbed clandestinely at the Experimental Apiary here, not long ago. We were able, however, to save the bees of one colony.

Yours,

A. BERNARD,

Treasurer Algerian Beekeepers' Society.

(We have very little larceny of bees or honey in the United States. This petty thieving is almost all confined to the South and West. Our good friend, J. J. Wilder, who has thousands of colonies of bees scattered in the wilderness of Georgia, says that he loses thousands of pounds of honey every year through larceny, as the Georgia "Cracker" seems to consider everything in the woods as public property. In the North, the thieves do a better business in robbing the banks or the big safes of wealthy companies, and usually leave the bees alone. Is it any better for the public?—Editor.)

### Who Owns the Swarm?

**A**N interesting lawsuit concerning bees is reported by the British Bee Journal of October 28. Briefly, it is as follows:

A swarm of bees was found in a hedge on the land of James Batstone, by Herbert Rummig, and was carried away by him. Batstone, who has bees, claimed that the bees were his, but could not prove ownership except that he missed a swarm which left one of his hives. He claimed damages, or the estimated value of the bees. The swarm had been taken by Rummig by crossing a ditch, also on Batstone's land. The swarm was hanging about a hundred yards from Batstone's apiary.

The judge gave judgment for the defendant. He quoted the original law laid down by Emperor Justinian that: "A swarm of bees that has flown from your hive is still considered yours as long as it is in your sight, and may be easily pursued. Otherwise it becomes the property of the first one who takes it."

In this case the swarm had never been in the owner's sight; it was a hundred yards from his home; it was never seen by the plaintiff on leaving the hive, on its way, or when it was taken. If it left the owner's sight, his property right in it was gone, although he might recover it, but if anybody else found and took it, it belonged to him. It appeared to him



Back view of Barber's portable packing case and summer shade.



that the law was as it was hundreds of years ago, that one lost the property in a swarm if he did not immediately go after it and catch it while it was in his sight.

As to whether trespass was committed, that was an entirely different question, and did not arise except in an action for trespass.

The editor suggested that the law should be altered so that a swarm of bees on the premises, near to the apiary of a beekeeper, should be his property, unless, of course, another beekeeper had seen the bees issue from his own hives and followed them. Under the interpretation as given in this instance, it would be open to any passer-by, seeing a swarm of bees, in a garden or orchard, which had swarmed from hives situated therein, to step in and "collar" them, the owner having no remedy except in action for trespass, if he had not actually seen the bees leave the hive and cluster.

### A Portable Winter Case

Edward C. Barber, of Massachusetts, sends us the accompanying photographs of his portable winter case, which he describes as follows: Each case holds six colonies and can be used as a summer shade and a winter packing box. There is six inches of packing space around the hives, which can be tiered up. The case is 45 inches high in front and 55 inches high at the back. The front doors are used for alighting boards in summer, as shown in the picture. On each side is a 2x4, which is 16 feet long and which extends past the ends of the case. Four men can easily load the whole outfit onto a truck and move it anywhere. They are great for packing the bees for winter, snug and tight and with the packing removed provide a cool shelter for summer.

### Robbing

I am a novice and your article on robbing, page 158, caught my eye. I have been having quite a bit of robbing. I have often read that if a colony was not able to defend its home against robbers they were not worth fooling with. I have had several cases of robbing and in each case I have got them stopped, and my plan is to get all the robbers in the hive being robbed, close the entrance with a block so no bee can pass. To prevent smothering I drive an 8-penny common nail under the cover on one side, then I leave them imprisoned thus for 48 hours; then, after dark, I remove the block from entrance and draw the nail from under the cover, and when I go next morning to see how things are, I usually find them quiet. I presume if the queen has not been harmed, in 48 hours' time, enough of those robbers will become loyal and stay to defend the hive. At least they have done so for me. I hope someone else will try the plan, and if not successful close them up again for 48 hours.

Another plan I tried was when I discovered robbing late one evening in October, last year. I closed the entrance with the robbers in, and after dark I opened it up. The robbers crawled out and covered the front of the hive. The next morning when I went out the robbers were going full tilt. I looked around to find all my bees quiet except at one hive, and of course that was where the robbers were coming from. I picked it up and moved it back about one rod, and put an empty in place of it. When the robbers returned and found no place to store their stolen sweets, they were so demoralized that robbing was not only stopped at once, but some of the robbers seemed to return with their loads to the pilfered hive and proceed to defend it. In no case have I ever moved the colony being robbed.

H. P. GANNAWAY.

### Queen Supersedure

By Henry Brenner

THE realization by the bees of a condition in the hive necessitating a change, and their subsequent activities to bring about the change has been styled by Maeterlinck as the operation of an intuitive law which he designates under the phrase "The Spirit of the Hive." Whatever be the force of intelligence that acquaints a colony of bees with the necessity for a change they ruthlessly carry out the mandate.

When a colony of bees realize that the mother queen is failing, either because of age or other infirmity, queen-cells are started. The building of such cells is commonly called supersedure.

My observation is that in building swarm-cells, under the normal reproductive impulse, the bees and queen work in unison. Supersedure, on the contrary, seems to be only the work of the bees. They work on their own initiative. The queen takes no hand in the work of superseding.

My observations lead me to believe that the bees build these cells with-

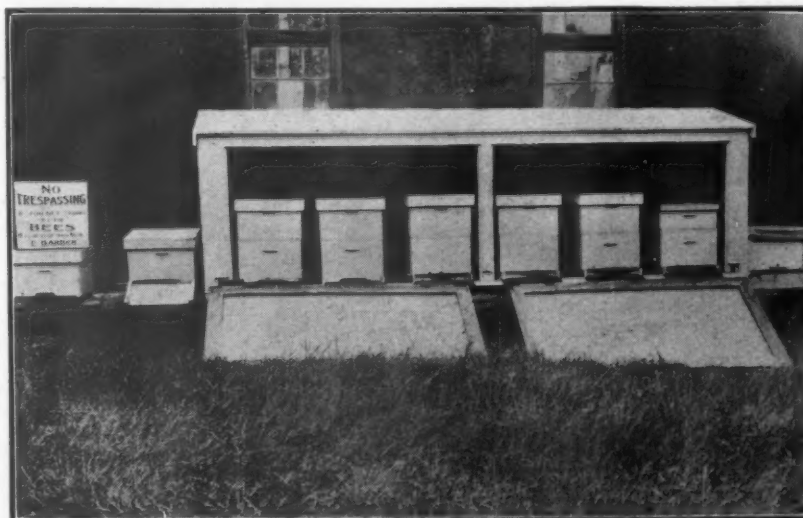
out the knowledge of the queen. In superseding, the bees often, I may say generally, transfer larvæ or eggs to queen-cells in remote parts of the hive, which are seldom or never visited by the mother, or build new cells over the larvæ.

Supersedure cells usually occur in the outside combs of the brood-nest. That the bees do transfer larvæ to remote portions of the hive for superseding is proved by my having found in Porto Rico two colonies, one with one cell, and one with two, above an excluder. In both cases I examined the brood-nest and found two or three more cells, but these were on the outside combs.

Years ago, in Texas, I found very little requeening necessary in my outyards, while at my residence, in my experimental apiary, I found more than twice as many failing queens. This troubled me for some time. I could see no adequate reason for it. At last an accident suggested a solution. The bees of one of my best breeders were found to be in the act of superseding. I went, the next day, to cut out the cells. I intended to preserve the queen as long as possible because of her former good record and her type qualifications. I intended to use her to rear drones for my mating yards. Judge my surprise to find the cells gone. The mark of the queen was upon them, i. e., the opening at the side of the cell as made by an enraged queen when finding a possible rival. This gave me a clue which I followed.

Investigation brought me to the conclusion that the bees do the superseding and that they watch or guard the queen continually to prevent her from tearing down the cells. In my home apiary, where I open the hives often, the bees become disturbed by the smoker and are for a time disorganized. In consequence, the queen is given a chance to find and destroy the cells. In one-half of the cases where I saw evidence of supersedure I found that the cells were destroyed the next day by the queen when I opened the hives again.

If supersedure cells are put above



The doors of Barber's packing case are used for alighting boards in summer.



an excluder they are safe. The bees will not destroy them. If the cells are cut from the comb and put in a protector they may be left in the brood-nest and never come to harm. In due time a young queen will be found laying in the hive.

I realize that in making this assertion I am stating an opinion in conflict with that of the best-known writers on this subject. For instance, in the March number of *Gleanings*, Mr. Doolittle wrote: "In a case of supersedure the bees pay very little attention to the cells except to supply them with royal jelly, allowing the mother queen to go about them as she pleases."

Here in the tropics, queens lay during the whole year, except for short periods of rest at intervals. They wear out very quickly and consequently we have cases of supersedure in our apiaries at all times. Our queens here seldom do efficient work for more than one year to 18 months. This gave me excellent opportunities to continue the experiments begun in Texas, and I was delighted to find that my conclusions were abundantly verified.

In cases of supersedure, the young queen and the hive mother work together, but not for long. In looking into the hive a few days after one finds it to contain two queens, the older one will be found to be missing. Some writers state that it is only a mother and daughter that will thus labor together. I have found evidence to cause me to doubt this. It cannot be always the case. I winter young queens by the Alexander method, above the brood-nest. In uniting these super colonies with the main colony for the honey-flow, I found in at least three cases that the old and new queen were working together. I marked these hives and examined them again at my next visit. In every case the old queen was missing.

Supersedure cells from good stock, when reared under favorable conditions, are as good as the best swarman cells.

In a great many cases the bees were evidently trying to supersede their queen when a careful examination failed to reveal any cause for such action. The causes of supersedure are, therefore, at certain times, in doubt, but usually can be attributed to age or decrepitude of the mother.

### Bluevine or Climbing Milkweed

In the April, 1919, issue of this Journal we had some short articles about this plant. Much interest has been aroused and numerous requests for seeds have been received. While under favorable conditions it is a good honey plant, we would call attention to the fact that it is a serious pest in the corn fields and would warn readers against planting it in localities where it is not already established. Even where it grows freely it is not always valuable for honey, apparently.

The photograph herewith shows the leaves and the seedpods. This photograph was taken by the associate editor for his book on honey plants which will shortly be published.

### Sugar Feeding

"Special orders for sugar have been placed with Sugar Equalization Boards in Massachusetts to feed the bees. A ton and a half has been allowed for 2,000 swarms."

The above is a clipping that I took out of the *Dearborn Independent*. It shows about how much sense some of the public officials have. If this is true, a ton and a half of sugar would be a pound and a half for each colony; that would help the bees a lot! I fed my bees this fall 20 pounds for each colony, and I am not sure

now whether or not they have enough to last them over winter.

In your editorial you ought to comment upon this "liberal allowance" for the bees of Massachusetts.

C. O. SMEDLEY.

(The clipping is interesting. If the authorities figure 1½ pounds per colony, it is just in the line of the average man's knowledge of bees and beekeeping. But they may figure that only one hive in 10 will need feeding, in which case the amount would be about correct.

More than once we have seen people who imagined that we were making ready to manufacture honey, when, in a short time, we were buying 1,000 pounds of sugar for 500 colonies. But every man is ready to acknowledge that the amount is small when he learns that it figures only 2 pounds per colony. It is well to bring such facts before the public once in a while.—Editor.)

### Bee Incubation

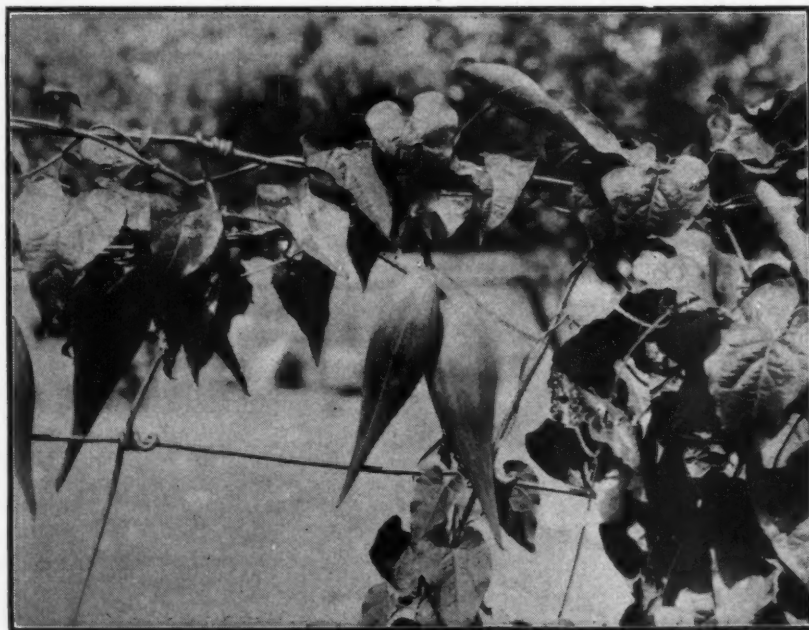
By Will H. Gray.

IN reading over the lectures of Dr. Phillips and Mr. Demuth there appears to have been a lot of discussion on the subject of keeping back brood rearing in the early part of the year, and then quickly building up for the honey flow, thus avoiding the wastage of stores and bees without any adequate return. This was in California, where the bees can fly about the year around. It was suggested then that a cold storage plant might answer the purpose and keep the bees quiet until eight weeks or so before the honey flow opened.

Years ago, when I had my first hive (and it was a weak one), I was greatly afraid they would die out, so, being of a mechanical turn of mind, I fitted a tin can in the back of the hive behind the dummy board (My frames ran with the entrance then, and they do still). I had a drain cock out of this can so that I could run the water off without disturbing anything. Then, night and morning, I filled the can with water at 80 degrees F., and lo and behold the queen came and filled the back frames solid with brood and then worked forward from that. I don't remember how long I kept it up, probably two or three weeks, and I fed all the time. I remember explaining it all to the Rev. J. G. Digges, editor of the *Irish Bee Journal*, and he threw cold water on my schemes by suggesting that I make a separate foot warmer for each bee!

A few years ago I tried out a similar plan, only using instead of the hot water, a six-candle-power carbon electric lamp, and the results were again very good, the queen taking up her quarters next the dummy board.

Of course these experiments are not conclusive enough except for further and more accurate tests. But my idea is that instead of the bees just dragging along trying to pull through until the honey flow, one might have by artificial heat a large colony that could do something with the flowers then in bloom, or else go in for the



Seed pods and leaves of the climbing milkweed or bluevine.

package trade, that must have early bees to succeed.

What I am doubtful about is whether the bees would be worth the sugar they cost. The heat cost would not amount to very much when the beekeeper is near a power line. At a pro rate of 5c per k. w., a six-candle-power carbon lamp burning steadily for three weeks would cost 50c. The wiring would be extremely simple, consisting of a pair of wires running along the back of the row of hives, and weatherproof sockets inside the hives, with their two wires coming out through a hole and attached one to each of the mains. If there were some good early honey flow, such as fruit bloom, etc., the results might be all right, as we all know the difference between strong and weak colonies at such times. This system would have to be carried out in a country where the bees could fly now and then during the time the heat was applied. At any rate, it would be worth while trying it out accurately, on enough colonies to be sure of the results.

Of course, the better protected the bees were, the less heat would be required inside, and the distribution would be more uniform.

One would also have to make sure there were enough bees to protect the brood before switching off the heat. British Columbia.

(Of course, this thing would have to be tried comparatively before one could make sure whether there was anything in it. But we can testify that the most successful colonies that we ever had were located in a hot-house. They came through the winter so strong that they were powerful enough to make surplus honey from fruit bloom. But as we had them only one year, we were unable to find out whether such a scheme would succeed every season. Try your scheme on half of your colonies and report results in bees or honey. We will be glad to publish the report.—Editor.)

### Marketing

By C. C. Baker

I am very much pleased to note that in your last issue you took the liberty to give the producers who retail honey a little lecture on the folly of their ways. Heretofore I had been reading "cultivate your home market" so much in the different journals that I had about given up all hopes of ever seeing these retail producers "get theirs."

It is my opinion that if we can get the big jobbers to handling honey exclusively, that there will be a much better market created for it, for this reason: these big fellows, like the packers, have thousands of live salesmen on the road all the time. These salesmen call on all the grocers daily, as well as on hotels, restaurants, and every business house in existence that could use the honey. They are taking orders for all kinds of food-stuffs, and while the retail buyers are giving orders to these salesmen they

are certainly in the right mood to order honey. Honey producers haven't the time to cover the retail trade like these salesmen do, and if they did have the time, they are not salesmen—not one in a thousand.

How much did the farmer get for his pork before the packers took hold of it? And how much for his eggs, and his beef, and his fruit, and his everything he raises—but honey. And honey is the only thing not handled by big packers of some kind.

Let these big buyers do the distributing for us, that is their business; producing honey is our business. We get paid for our business, let the other fellow get paid for his business. Why should we worry

what the other fellow takes on our honey, as long as he does not invade our territory with bee yards.

When one of your neighbors comes to you for some honey, send him to your local grocer; if your grocer does not handle it, let the neighbor do without. There will soon be such a fuss kicked up that it won't be long until your local grocer will ask you to sell him some honey—then stick by him.

I worked this very scheme to perfection, and less than two weeks ago, following the purchase of several small lots of honey from me; this very local grocer of ours purchased a ton, in bulk.

Washington.

## DR. MILLER'S ANSWERS

### Miscellaneous

I am a farmer with a part interest in a 600-acre farm on which I have lived for 19 years. I have been running an apiary as a side line, but am about to dissolve my partnership on the farm, and as I think of taking up beekeeping as a business, thought I would tell you my experience and ask some advice. I had 10 colonies until the year 1917, when I bought 15 more colonies from some neighbor boys. I tried to buy some of another man; he had 30 stands, but they were in old dry goods boxes, and he wanted \$150 for them, and I considered that was too much for them so I didn't take them and he sold them to a neighbor for \$50. The neighbor's sons then bought them and billed them to sell at public sale.

In the meantime my honey trade had grown so that I couldn't supply the demand, so I saw the boys and bought the 15 colonies of them at private sale for \$3.50 per stand. Of course I had to change all of them, so I put them in 10-frame standard hives and I found it quite a task, as they were so heavy for one man to lift.

1. Do you think I gave too much for them, considering the shape they were in? I had always sold the section honey, but found that it took too much of my time just when I was busiest with the farm work, so I changed to produce extracted honey. The year of 1918 I had 25 stands of bees and I sold \$300 worth of honey. I put it in half-gallon Mason fruit jars and sold it at \$3 per gallon. About the time to harvest my crop I was called to go to Camp Grant, so had to leave my honey for my family to harvest and sell for me, and I may have lost some that way, for the extracting wasn't finished until after I was discharged and got home.

Early this year I bought 30 more colonies of a man who said that the old ones didn't do anything but swarm, and that all the honey he got was from the new swarms. Some of them were in 8-frame hives and some in 10-frame, but they were all old hives, so I bought them at \$3 per hive. I only had four swarms issue from my 58 stands of bees last summer. I consider that pretty good.

I have not finished extracting this year's honey crop yet, but will have about 3,000 pounds of extracted honey, and about 300 pounds of section honey, which sells at 25 and 30 cents per section in this locality.

2. Is that a good crop for that many colonies, or should they do better?

The majority of my honey is white clover, though I have some darker fall honey. My bees are mostly black, but the last two springs I have secured golden Italian queens for some of them. One queen I have is very prolific, so I gave her two stories for brood; then after she had filled the upper story with brood I caught her and put her back in the lower story and put on an excluder.

3. Would it have been better to have divided this hive?

4. To divide the hive should I take the upper story with brood and eggs and set it about two feet away? If I did that would they hatch them a queen from the brood? Or would it be better to put the upper story on the old hive stand and move the old hive away?

5. Do you think one could make a good living on 20 or 40 acres in this section, with some fruit and about 500 stands of bees? Could one man take care of that many bees?

6. About how many colonies of bees would two acres of sweet clover and two acres of buckwheat make pasturage for?

7. Would it be better to run a home apiary for section honey and the outapiaries for extracted honey?

8. In producing section honey is it better to clip the queen's wings?

ILLINOIS.

ANSWERS.—1. No; at the present time this is a reasonable price.

2. An average of 50 pounds per colony, year in and year out, is generally considered a good average. Yours was 66 pounds. So that its a very fair crop.

3. If you wish increase it is better to make it from colonies that are not likely to give you much honey, raising your queens from your very best colonies.

4. The first method you mention is good, but not so good as the second. Taking away a hive of brood and bees, leaving the queen and all the old field workers on the old stand is likely to give you a colony too weak in bees to take care of the brood.

5. There is a very good living in 500 colonies of bees aside from the yield of 20 to 40 acres of land. One can care for 500 colonies, but they ought not to be all in one apiary, and one could not do much with the land without hiring help.

6. That is a hard question to answer, and I doubt whether anyone can answer it correctly. It is a guess at best.

7. Yes.

8. Yes, certainly.

### Bees Leaving Hive—Disease—Rearing Queens

1. What is the matter when the bees go out of their hive and go in another hive with bees in it?

2. What is best to do if the bees have diseases?

3. When is the best time to rear queens?

4. What kind of a bee is brown and has 3 snow-white bands?

5. Do you think there is any chance to get pure Cyprian queens or bees?

TEXAS.

ANSWERS.—1. Bees may "drift," that is, go into the wrong hive, when they are out for the first time and are attracted by the greater noise of the bees of another hive; also when their hive has been moved from its position. Bees may also leave their hive entirely and join another hive when they are starving, or



they may swarm when they are crowded for room.

2. It is out of the question to treat of diseases in the replies to questions. Send for the book "First Lessons in Beekeeping," or "The Hive and Honey Bee Revised." You will find a whole chapter in each of these books on diseases of bees.

3. Queens may be reared all summer long. But the best time is during the honey crop.

4. We don't know of any such bees.

5. Cyprian bees have not been imported, that we know of, for years. They are so cross that it is not likely anyone has ever tried to keep them pure.

### Requeening

1. I have a few colonies of hybrid bees which I wish to requeen next spring, and wish to keep them queenless the shortest time possible. Would the bees accept a ripe queen-cell immediately after the old queen was killed, or would I have to use a queen-cell protector?

2. Would the bees build queen-cells if I should put all but one frame of brood in a new hive, leaving the queen and one frame of brood in the old hive, and set the new hive on top of the old hive with a queen-excluder between?

TEXAS.

ANSWERS.—1. No, they would not accept an unprotected cell till fully conscious of their queenlessness. That might be less than an hour or more than a day.

2. Maybe, and maybe not. The more the brood is cut off from the queen, the more likely cells will be started. A zinc excluder is better to get them started than a wire one. A cloth nearly covering the excluder will help. The higher up the brood is, the better.

### Prevent Swarming

I intend to move my bees in the country and will be with them about one day each week. I would like to adopt some plan to keep them from swarming, or swarm them at my convenience.

When a colony shows signs of swarming, if I should put brood-chamber above a hive filled with foundation and queen-excluder on it, putting the queen with one frame below, cutting out all the queen-cells in the above hive, will that prevent swarming? If not, kindly give the best method generally used in out-apiaries.

NEW YORK.

ANSWER.—Yes, the method you indicate will help to prevent swarming, though we cannot, with any method, make sure of having no swarms at all. Cut the queen's wings, then the swarm can't get away so easily.

### Size of Hive—Full Sheets—Italian vs. Blacks

1. Bees swarm here in April, but we get no surplus till the latter part of July and August. Between these dates there is a continuous, though light, flow of nectar, just enough for brood-rearing. Under these conditions would you advise me to use 8 or 10 Langstroth frames in the brood-chamber?

2. From a purely financial viewpoint, do you consider it economy to use full sheets of foundation?

3. Will a colony of Italian bees gather more honey in a season than a colony of blacks or hybrids?

4. Under conditions in No. 1, what can I do to have my colonies reach maximum strength by July 15?

TEXAS.

ANSWERS.—1. Eight-frame hives are too small unless you use two stories for brood. Two stories are really needed if you wish the full production of bees from prolific queens. Have them as strong with bees as you can get them at the opening of the flow.

2. Yes. Try it comparatively for yourself. That is the best way to be convinced. Don't try it on only a hive or two, but on a fair proportion of colonies. Full sheets will give you nearly all worker combs. Starters will give you any kind of combs the bees take a notion to build.

3. It would be a mistake to lay down a flat rule. But on the average Italians are much better producers than blacks.

4. Give them all facilities to breed by giving the queens ample room and seeing that they have plenty of food.

### Horse Stung—Freak Queen

In your November issue a New Jersey man wishes to know what to do for stings on a horse; my experience was successful. The horse laid down and acted as though he had the colic. I took a corn knife and scraped the stings off and then took a large pail, filled it half full of salt, then water, and stirred it up; soaked burlap sacks and covered her up, then kept them wet. In three hours I drove home none the worse off. I bought a queen this summer which arrived too weak to live. I ordered another, which was a fine looker. When she began to lay there were from two to six eggs in each cell; they never hatched a bee. What is the cause? I finally killed her and doubled the bees that were left (which were few) with another colony. I have only four, but they are good and strong.

IOWA.

ANSWER.—Your advice as to treatment of a horse that has been badly stung is very good. Ammonia diluted with water would probably be good, too. But it is easier to find salt and water than ammonia, on a farm or about an apiary.

Your queen was a freak. Once in a great while we come across a defective queen and we are unable to tell what is wrong. You might buy 500 queens before you would again have such an occurrence. It was an accident, evidently, and nobody to blame.

### Increase

Would it not be easier and cheaper for anyone desiring increase to make ready for same in the fall rather than wait till spring, as follows:

Place a regular hive-body (filled with frames and foundation) underneath the regular hive, letting them have the use of both bodies; then, in the spring, place the lower one on top, letting bees fill both hives with brood and bees; then introduce a queen into the one that would be queenless after disuniting.

NEW YORK.

ANSWER.—It is all right to get your hive ready in the fall or winter, but I cannot see much to gain in giving the bees a hive full of foundation until they can use it. You would have to give it to them before the crop ended. Otherwise it is probably better to keep it away from them till spring.

### Getting Good Stock

1. Is there the same danger of getting inferior offspring in breeding from an extremely old queen as there is in breeding from live-stock that is feeble with age? Would it be advisable to breed from a queen that has been the best in the yard when she was young, but has materially deteriorated with extreme age?

2. How near the beginning of the only profitable honeyflow that we have, which only lasts four weeks, can one requeen colonies that are as weak as to cover only six frames, if he has to buy early queens, and wants them to pay for themselves in that flow alone?

NORTH CAROLINA.

ANSWERS.—1. Perhaps there would be danger of inferior offspring with a very old and decrepit queen. This is difficult to decide. Better not wait till your queen is too old, especially as you might not get anything but drone eggs.

2. You can requeen at any time, if you buy your queens. But if you rear them, better wait till the honey crop is fairly advanced. Bought queens, introduced at the beginning of a flow, will not produce workers in time for that flow, unless it is an extremely prolonged flow. It takes 35 days before the egg laid gives an active field worker. Reared queens will produce them only for the next flow.

### Golden vs. Three-Banded

How do the golden Italian bees compare with the three-banded Italians in honey gathering, in disposition and in fighting foulbrood?

MICHIGAN.

ANSWER.—The goldens are sometimes very good, sometimes rather inferior. Much depends upon whether they were bred only for color or whether other qualities were considered also in raising them. Personally, I prefer the pure, three-banded Italians, bred with a view of securing the main characteristics of the race, without consideration of extra yellow color.

### Skunks

I have a number of weak colonies of bees this fall. They have done nothing all summer. I have noticed skunks around my stand; do you suppose that they have made them weak? Please let me know what you think about it in your next Journal.

WISCONSIN.

ANSWER.—Skunks are fond of bees, but it is hardly probable that they could weaken colonies of bees in an apiary. If your bees have done nothing all summer, it is more probable that the honey crop was short and that they did not breed as they should. However, if you have any skunks in the vicinity it may be worth while to trap them.

### Foulbrood—Robbing

1. I have a few hives of European foulbrood in my apiary. Should I requeen the whole apiary or just the hives that have it? Of the two, which is the hardest to control, American or European foulbrood?

2. Are Italian bees more resistant to European foulbrood than the blacks?

3. Does nosema-disease affect the flying bees or the brood; is it a new disease, and do you think it is as bad as foulbrood?

4. While I was extracting honey this year the honey-house door blew open while I was eating my lunch. When I returned I found the bees doing a land office business. It struck me that the bees robbing the house were from about 5 or 6 hives, for the reason there was an unusual amount of bees at their entrances. Do you think it was the whole yard, or just these few hives?

5. What is the proper thing to do with a bad case of pickle-brood in a hive of black bees?

6. I introduced a young Italian queen about a month ago. When I opened the hive the other day I found some drone-brood in the worker-cells, also 2 and 3 eggs in one cell, some on their side and some on end. I also found some good worker brood. This is a small swarm, covering about 4 frames. What is your opinion of this queen?

CALIFORNIA.

ANSWERS.—1. Requeen only the hives that have it. The two diseases differ, but both are difficult to cure. American foulbrood, if thoroughly treated is likely to disappear. European foulbrood often shows itself when we think we have stamped it out.

2. Yes, without doubt.

3. It affects the full grown bee. It is not as bad as the foulbroods.

4. Undoubtedly only those colonies that were excited.

5. Be sure that it is only pickle-brood (sac-brood). Then feed them on sugar syrup, provided they are still strong enough to be worth saving.

6. Either that queen is deficient or there is also in that hive an old queen laying drone-eggs. Usually, when we see eggs laid several in a cell, it is a sign that there are some drone-laying workers in the hive.

### Number of Bees in Pound—Shipping Bees

1. Tell me the number of bees to the pound, generally speaking?

2. Will it do to ship bees at this season of the year?

NEBRASKA.

ANSWERS.—1. For all general purposes we figure on 5,000 worker-bees to the pound.



There are less of them when they are full of honey. There are more of them when they are starving.

2. It will do to ship bees now better than in the summer. But the best time to ship bees is when they have the least honey, in the spring, before they breed very heavily.

### Using Old Supers

1. White clover honey failed this year, as there was so much rain until clover matured too much to contain honey, and I now have a large number of sections that are not filled; some have only a small piece of comb built in them from the starter. I ask your advice as to what I shall do with them.

2. Will supers just as they were taken off be good for another year without taking them apart?

3. Some sections have a little unsealed honey in them; will the bees use them, or must I take them out?

INDIANA.

ANSWERS.—1 and 2. Those supers will be very good for another season, just as they are, provided you keep them in a dry, clean place, away from dust or mice. They will need more scraping when full than if they had been filled the first time. But the comb in them will attract the bees to the super.

3. It is not necessary to remove the honey, unless it is amber honey and you expect to get white honey in the spring. Since the combs are not sealed, you might place all the partly filled sections in one super, and use it to feed the bees in early spring.

### Amount of Bees for 20 Acres of Clover

Near where I live there is a considerable quantity of white sweet clover that grows along the sidewalks, in vacant lots and alleys. My estimate is that there would be about \$0 acres of it available for bees if it was all together. Would 100 colonies be too many for this location?

CHICAGO.

ANSWER.—Unless there are other plants, I would be inclined to think it would be hardly sufficient for a good honey crop for 100 colonies. Better keep a less number. However, that is only a guess.

### Requeening

This past season I have had a number of colonies go wrong by allowing them to requeen themselves in cases of supersedure. Have had virgins go nearly a month before laying, and then disappear in a few days. In the future I propose to keep laying queens in nuclei for immediate use. In case of a natural swarm with clipped queen, would it work with quite a certainty of success to run in with the returning swarm a new queen taken from a nucleus?

LONG ISLAND.

ANSWER.—I have seen queens balled which happened to join a swarm. So there would perhaps be danger of the new queen being balled, which is always objectionable. But if you can make sure of the clipped queen, so that she will not return to the hive, you can probably have your new queen accepted by caging her a few hours. Yet, if the colony has queen-cells, there is still danger of non-acceptance. Give your swarm on the stand of the old hive, giving them the new queen, and remove the old colony to a new spot. Then all will be harmonious.

### Supers On in Winter

I have 10 colonies of bees in ten-frame Danzenbaker hives. I used the shook-swarm system last summer and my colonies are larger than usual. I thought they would not have room for themselves and their provisions in the shallow ten-frame Danzenbaker brood-chamber (7½ in. deep), so I left a super partly filled with honey on the brood-chamber for over winter. The hives are covered with tar paper and kept in a woodshed, where the temperature varies around zero in cold weather. But they are in no draft. They made about 80

pounds of honey per colony in the supers this summer and the combs seem to be filled with honey. Would you leave the supers on?

IOWA.

ANSWER.—It may not be necessary, but it will certainly do no harm in those very shallow hives. When you speak of having them in a woodshed you surely do not mean that you will keep them closed up in there. If you have them so they can fly in warm days, they are just that much better off than in the open.

### Feeding Outapiaries—Granulated Honey in Combs

1. My feeding of winter stores has hitherto been confined to a small home apiary. Last summer I branched out and placed 55 colonies 14 miles from home. Fortunately a heavy buckwheat flow obviated the necessity of feeding this year, but I wish to know the quickest and most satisfactory method of feeding outapiaries. I take it for granted that it is customary to feed syrup warm. Do large commercial beekeepers manage this by making the syrup at home where they have some conveniences, or take the heater and sugar to their outapiary? What is the best contrivance for making syrup in large quantities without danger of scorching the syrup?

2. I was unable to extract my buckwheat honey until the 10th of November, too late to place the extracted frames back on the hives for bees to clean up. The buckwheat honey had granulated somewhat, but not badly. Will this granulation affect the condition of the combs next spring, and will I be liable to have trouble with them on this account? I have been told that on account of granulation in these combs all my honey next season is quite likely to granulate quickly and may give me a good deal of trouble—is this correct?

ONTARIO.

ANSWERS.—1. The manner of making syrup depends upon the conveniences in reach. Cold water will do to make syrup, but it is both better for the bees and a little more speedy to use hot water. The proper quantity of sugar poured into boiling water will speedily make all the syrup you want. Then pour it into 5-gallon cans, with screw-cap spouts similar to gasoline or coal oil cans, for convenience in pouring it into the feeders. Keeping the cans well covered during the trip, you will have no trouble in reaching your outapiary with warm syrup. But variations from this method are often resorted to. They also percolate the water through the sugar, letting it come through a sheet of muslin.

2. It is not likely that you will have any trouble from that granulated honey, if you return the supers to the bees a few days before the opening of the crop. They will clean them and burnish them at that time. The worst trouble I can see is their keeping some of that dark honey in the supers and mixing fine white honey with it, next June.

### Wintering—Bees on Leeward Side of Tree

My beekeeping for the last 25 years has been in California, where the wintering problem was not seriously considered, which is my reason for asking a question or two.

1. Will one frame taken from a 10-frame hive give sufficient space for wintering in a cold climate?

2. You say in Gleanings, page 587? "They know that their hive is the right-hand one of a pair." I infer from this that the hives face in opposite directions; is it not so?

3. I think, Doctor, on further investigation you will find that the reason for the bees being on the leeward side of a tree in bloom, Gleanings, page 587, is because a bee cannot alight flying with the wind, and if she should undertake to do so she would be carried through to the other side. In California I invariably faced my hives toward the east, as only on very rare occasions did the wind blow from any other direction than from the coast (west). Occasionally we had a desert (east) wind, and it was always very strong. The bees on these occasions had a very hard

time entering their hives. They would be blown to the back of the hives in clouds awaiting an opportunity for a lull to skip around the corner of the hive to enter; but when the wind blew ever so hard from the west they seemed to have no trouble in making a landing. When the wind blew squarely into a hive and when a bee more venturesome than the others undertook to land she would invariably "tumble" in.

UTAH.

ANSWERS.—1. Abundant, I think.

2. No, the two hives of a pair face in the same direction.

3. If you will observe closely next time you see bees working on a honey tree, I think you will change your mind. Not only in a strong wind, but in a gentle breeze, when scarcely a leaf is stirred, there will be a cloud of bees on the leeward side and none on the windward side, although the leeward side may be the farther side from the apiary.

(The answers to the above are in Dr. Miller's own handwriting and we are glad that he is getting well enough to do that much.)

Question No. 3 is whether the bees come from the leeward side to a tree because of getting the odor wafted by the breeze or because they must fly against the wind to get anywhere. It seems to us that both of these causes serve. Bees cannot very well get the odor except from the leeward side, and in a strong wind they might be carried beyond it if they did not come steadily against the wind.

—Editor.)

### Wintering—Cutting Out Queen-Cells

1. What would be the longest time that bees can stand being housed up?

2. Would you advise putting bees in winter quarters at this date? I have a good basement, high and dry.

3. I am using the 10-frame hive and all frames are full. Would it be safe to take out one outside frame for honey? Would there be stores enough for the bees?

4. At what time do you advise cutting out queen-cells?

MINNESOTA.

ANSWERS.—1. The longest time I have known bees to be kept in a cellar was 186 days. This was achieved at Charlesbourg, Quebec, by Mr. Verret, and the bees came out in good shape. But they must have good healthy food and must be kept at the right temperature, between 45 and 50 degrees, or at whatever degree keeps them quietest.

2. They may be put in the cellar earlier in Minnesota than in countries farther south. The proper time is shortly after they have had a good flight, before cold weather.

3. If your combs are all heavy with honey, they will winter on 9 combs full, but it is quite likely that they may need some feeding in spring.

4. We never cut out queen-cells. Those who practice that method do it whenever they find queen-cells with eggs or larvae in them, at swarming time. But unless you take steps to prevent swarming, it does not do any good to cut out the queen-cells.

### Transferring—Stimulating Brood-Rearing

1. I have 12 colonies of bees in box hives and would like for you to advise me a little on this question: I want to transfer them to movable frame hives next spring, as soon as it gets warm. I want to put them on foundation. Could they get pollen soon enough to raise their brood, or could I feed them something that would take the place of pollen?

2. What would be the best to feed them for pollen.

WEST VIRGINIA.

ANSWERS.—1. The proper time to transfer from box hives or gums is during fruit bloom, because they have less honey and less brood and more chance to repair their losses than they would at any other time of the year. But if you want to transfer only the bees and do not wish to save the combs, you may do it

at swarming time, by driving most of the bees and the queen out of the box hive and hiving them just like a new swarm. The old hive is then put a short distance back of the new one and in 21 days the hatched bees are united to the transferred hive. The better way, however is to transfer all the brood combs during fruit bloom. You will find directions given at length for this in the "Langstroth Revised," paragraphs 574 to 581, or in "First Lessons," paragraphs 94 and 95.

2. It would be a mistake to transfer your

bees so early that you would be compelled to feed them either pollen or honey in quantity. But to answer your question as to what would take the place of pollen; I have supplied flour to bees, in open boxes, at times when they could fly, before there was any pollen. The bees are attracted there by placing some old combs on the flour. Some of our modern scientists assert that flour is useless as pollen. But I am sure they took it in large amounts and used it.

### Can This Be So?

With regard to the bees' fondness for blue flowers. This is indisputable. Centuries ago the Hittites, and after them the Amalekites, discovered this partiality, and turned it to evil account by growing flowers blue in color but rich in opiates, and so succeeded in making a drink from the honey which had a doping effect. Kings and peasants ruined themselves, body and soul, through this fibre-destroying beverage.—E. F. Hemming in British Bee Journal, page 454.

## MISCELLANEOUS NEWS ITEMS

### New Jersey Convention

The New Jersey beekeepers will meet at Trenton on January 13 and 16. Space will not permit inserting the complete program. Secretary E. G. Carr, of New Egypt, has made every effort to provide something of interest for every minute, and a live meeting may be expected.

### Error Corrected

In our December issue we gave the name of the secretary of the Washington State Beekeepers' Association as H. Christensen. This is an error. Mr. George W. B. Saxton, of Harwood, is secretary. That portion of the Journal was already printed before we discovered the mistake. The convention will be held at Seattle on January 22 to 24. Frank C. Pellett, of this office, and Kenneth Hawkins, of Watertown, Wis., expect to be present, if possible. The completed program has not reached this office at the time this is written.

### Short Course at Iowa

We have received an announcement to the effect that a short course for beekeepers will be held at the Iowa Agricultural College at Ames, beginning February 8. This is to be the same course that has been so successfully conducted in the Western States by the Government staff of beekeepers in co-operation with State officials.

### Nebraska Meeting at Lincoln

The annual convention of the Nebraska Honey Producers' Association will be held at Lincoln on January 19 and 20. The Nebraska beekeepers choose to meet at the agricultural college in connection with the annual round-up of organized agriculture. Kenneth Hawkins, of Wisconsin, and Frank C. Pellett, of the American Bee Journal, expect to be present.

### Kansas Short Course

An extension short course for commercial beekeepers, similar to those held in California and other Western States, will be held at Manhattan, Kans., at the Agricultural College, from February 2 to 7, 1920. Doctor Phillips and G. S. Demuth, of Washington, will be present. Prof.

E. D. Ball and C. P. Dadant will also take part in the program. Doctor Merrill has been actively engaged in developing the beekeeping work in Kansas for some time, and a good attendance is expected.

### Ontario Short Course

Professor Millen advises us that the short course in beekeeping at the Ontario Agricultural College will be held at Guelph from January 13 to 24. A number of prominent Canadian bee-men will be present to assist Professor Millen. Professor George H. Rea, of New York Agricultural College, will also be present. All interested in beekeeping are invited to be present.

### A Live County Association

The Randolph County, Arkansas, Association held their regular session on November 12, with 22 members present. J. V. Ormond and J. E. McKell, of Little Rock, were present and addressed the Association. Randolph County boasts of the strongest association in the State, with James F. Johnson President, J. D. Levil Vice President and John R. Kizer Secretary. The next meeting will be on March 11, at which time the members will list such supplies as they expect to buy through the organization.

### A Good Report From Montana

Mr. Cyrille Ghekiere is the only beekeeper on the Valier project in Montana. He reports that it is a good location for beekeeping and that he extracts from 100 to 125 pounds of white honey per colony per year. He uses the Dadant frame with a large brood chamber holding 15 or more of these frames, and extracts only from the super. He is thus always assured of ample reserve stores in the brood chamber. He winters in the cellar and reports that he is able to carry his bees through without loss by maintaining a temperature of 40 to 45 degrees in the cellar.

### Beekeepers at Canandaigua

We will have a bee convention in Canandaigua, N. Y., January 13. It will be our 31st annual gathering. F. GREINER.

### The Iowa Convention

The Iowa Beekeepers' Convention recently held at Des Moines was one of the best in the history of the organization. A special feature of the meeting was a banquet served by the association, to which prominent men in other lines were invited as guests. Editors of several farm papers, including the editor of the American Fruit Grower at Chicago, were present, as well as members of the faculty of the Agricultural College, State officials, etc. Such occasions do much to arouse interest in beekeeping on the part of those engaged in allied pursuits and lead to harmonious action when problems of general interest are before the public. The association voted to affiliate with the State Horticultural Society and thus to work in harmony with the fruit growers of the State. Such action speaks well for the future of the Iowa organization. Dr. Bonney was reelected President; E. G. Brown Vice President, and F. B. Paddock Secretary. F. H. Stacey, M. D. Johnson and J. C. Donohue were elected Directors.

### Ohio Short Course

A short course for commercial beekeepers will be held in connection with the annual program of the Ohio Beekeepers' Association during Farmers' Week at the Ohio State University, Columbus, from January 26 to 30. In addition to lectures by faculty members of the University, E. F. Phillips and George S. Demuth, specialists in bee culture of the United States Department of Agriculture, will also speak daily and give demonstrations on vital problems in beekeeping.

Similar courses have been held in other States in co-operation with the United States Department of Agriculture and have attracted over 100 beekeepers. Detailed information may be secured from Prof. James S. Hine, the Ohio State University, Columbus.

### Wayne County Beemen to Meet

The Wayne County Beekeepers Society will hold their third annual meeting in the Grange Building at Newark on January 30, 1920, and all interested are invited to attend. George Rea will be present. For further information address Deroy Taylor, Newark, N. Y., Secretary.



**Co-operation**

In the May number of the American Bee Journal, 1918, appeared an article on co-operative selling, page 158. It contains much of good common sense. But for those who are interested in co-operation I would refer them to Monthly Bulletin, Vol. viii, No. 7, of California Commission of Horticulture, Sacramento, Calif., G. A. Hecke, Commissioner. This gives a report of the work of many of the co-operative organizations in California, and they have been a success.

ROY K. BISHOP.

**New York State Meeting**

The State meeting of New York beekeepers will be held at Syracuse, February 4 and 5, this promising to be the most interesting and extensive meeting ever held by this organization and you cannot afford to let this meeting pass without attending same. For program address C. M. Cunningham, 303 University Place, Syracuse, N. Y.

**The National Convention**

As we go to press word comes from Secretary Justice to the effect that the National Convention will be held at Buffalo, N. Y., in Hotel Statler, on March 1, 2 and 3. This should not be confused with the conference of delegates to be held at Meulbach Hotel in Kansas City on January 6, 7, 8 and 9, at which it is proposed to work out a plan of reorganization of the National. Delegates representing all beekeeping organizations of the United States, teachers of beekeeping and members of allied trades will attend the Kansas City conference in an effort to devise a plan for a national organization which will meet the needs of the times. A report of this conference will be ready for the general convention at Buffalo, and it is hoped that the attendance will be a large and representative one. The program will be announced later.

**Missouri Meeting**

The annual meeting of Missouri beekeepers will be held at Columbia on January 19 to 23. Those interested can secure programs and other information from Dr. L. Haseman, at Columbia.

**Dr. C. C. Miller and His People**

Dr. C. C. Miller is an international figure. Every beekeeper who belongs to the progressive caste knows him through his writings. So a few words from his pen, after a siege of sickness, at the age of 88, will be of interest. Not only he has been laid up, but Miss Wilson, his sister-in-law, who has for years managed the "Beekeeping for Women" column in this magazine, has been suffering of her eyes. Dr. Miller writes:

"A few years ago Miss Wilson's right eye began to be obscured by a cataract, and in time became entirely blind. Oculists, however, advised that nothing should be done about it so long as she had one good eye. Then the left eye became troubled in the same way. When it be-

came so bad that she could no longer see to read, an operation upon the right eye took place with entire success, and after nineteen days' sojourn in the hospital she is expected to return home, seeing.

"With regard to myself, while I am thankful to be gaining, yet in some respects the gain is not so rapid as I should like. I find myself quite disinclined to make any mental exertion and quite inclined to put off till afternoon what I should like to do in the forenoon, and when afternoon comes to put it off till next day. Maybe it's pure laziness. I feel keenly your kindness and forbearance, and I'm hoping that as I am increasing in physical strength I may overcome this feeling of la—well, you can finish out the word with "ssitude" or "ziness," just as you like.

"Mrs. Miller seems to have become tired of being the only one in the family in vulgar good health, so on Wednesday of last week she fell and sprained both wrists, and has suffered severely with them.

"Since the above was written a telephone message from Elgin informs is that Miss Wilson's return home will be later than was expected, at least by a day or two.

"C. C. MILLER."

**Pennsylvania Farm Products Show**

The fourth annual Farm Products Show of Pennsylvania will be held at Harrisburg January 20 to 23. A special provision is made for a series of twelve premiums on honey and hive products with first and second offerings for each class. Exhibits should be sent to Chas. N. Greene, Department of Agriculture, Harrisburg, to reach him not later than Jan. 20, 1920. Exhibitor's name and address should be plainly marked on each package. Exhibitor's name will be placed upon exhibits after judging has been done.

The beekeepers' convention will be held at Harrisburg on January 21.

**CLASSIFIED DEPARTMENT.**

Advertisements in this department will be inserted for three cents per word, with no discounts. No classified advertisement accepted for less than 85 cents. Count each initial or number as one word.

Copy for this department must reach us not later than the 20th of the month preceding date of issue. If intended for classified department it should be so stated when advertisement is sent.

**BEEES AND QUEENS**

FOR SALE—Leather colored Italian queens, tested, June 1, \$1.50; untested, \$1.25; \$13 a dozen. Root's goods at Root's prices. A. W. Yates, 15 Chapman St., Hartford, Conn.

IT'S MARCHANT'S STRAIN that does the work, that's all. See ad elsewhere. A. B. Marchant, Jesup, Ga.

PURE ITALIAN QUEENS—Dependable breeding stock my specialty. Bees in 1 and 2-pound packages. Circular free. J. E. Wing, 155 Schiele Ave., San Jose, Cal.

FOR SALE—Three-band Italian queens from best honey-gathering strain obtainable (no disease). Untested queens, \$1.25 each; 6, \$6.50; 12, \$12; select untested, \$1.50 each; 6, \$9; 12, \$18; tested, \$2.50 each. Safe arrival and satisfaction guaranteed. W. T. Perdue, R. 1, Fort Deposit, Ala.

ITALIAN QUEENS OF WINDMERE will be ready in May. Untested, \$1.25 each; six for \$7. Tested, \$2 each; select tested, \$2.50. Write for quotation on nuclei. Now booking orders. Prof. W. A. Matheny, Ohio University, Athens, Ohio.

ITALIAN BEES (the kind that fill from 2 to 6 supers), for sale, in new 8 and 10-frame Root hives, at \$12 and \$15 per colony, if ordered soon. Bees to be shipped by express in April. Miss Lulu Goodwin, Mankato, Minn.

FOR SALE—After April 15, our golden Italian queens, untested, one \$1.50 or \$15 per doz.; select untested, one, \$1.75 or \$18 per doz.; tested, \$2 each. Safe arrival guaranteed. Tillery Bros., R. 5, Georgiana, Ala.

FOR SALE—Goldens that are true to name. Select untested, one, \$1.50; six, \$7.50; 12, \$13.50; 50, \$55; 100, \$100. Garden City Apiaries, San Jose, Calif.

FOR SALE—Golden and three-band queens. Untested, April, May and June delivery, \$1.25 each; \$12.50 per doz. Satisfaction. R. O. Cox, Rt. 4, Greenville, Ala.

25 CENTS buys a folder, telling the whys and wherefores and the principle of introducing queens. Just the thing for the beginner; and maybe something new for the expert. Nature's way on the inside of the beehive. The cream of thirty years' experience as a queen breeder in introducing queens. J. F. Diemer, Liberty, Mo.

FOR SALE—Famous strain of Italian bees and queens. We are booking orders for May and June delivery, 1920, for two and three-pound packages of our famous strain of 3-band and golden bees and queens. First come first served. Our bees are free from all foul-brood disease. These bees are record breakers for honey gatherers, and they are beautiful queens, and give a gentle worker bee. All told they will please, and do please, our customers. Write your needs and get price list. H. B. Murray, Liberty, N. C.

FOR SALE—Pure 3-band Italian queens, as good as you can buy with money. Write for prices. J. F. Diemer, Liberty, Mo.

FOR SALE—Italian queens, from best disease resistant stock, mailed as soon as hatched. Improved method for introducing with every order. Prices, April to October, 1, 75c; 10, \$6; 50, \$25. Order now for spring delivery. James McKee, Riverside, Calif.

BEEES BY THE POUND, ALSO QUEENS—Booking orders now. Free circular gives prices, etc. See larger ad elsewhere. Nueces County Apiaries, Calallen, Texas, E. B. Ault, Prop.

BEEES AND QUEENS from my New Jersey apiary. J. H. M. Cook, 141st 84 Cortland St., New York City.

FOR SALE—100 colonies of bees, most all in new hives with Hoffman frames. Plenty of stores. Address James Johnson, Box 265, Pocahontas, Ark.

**HONEY AND BEESWAX**

FOR SALE—New crop clover honey in new 60-lb. cans, two to the case; sample 20c. W. B. Crane, McComb, Ohio.

FOR SALE—Choice "Kentucky" clover extracted honey. Well ripened, thick and rich. Perfectly clean and suitable for table use. Packed in 60-lb. tins, two in a case, at 25c f. o. b. H. C. Lee, Brooksville, Ky.

FOR SALE—10,000 lbs. clover and 5,000 lbs. clover and heartsease honey, \$24 per case of two 60-lb. cans. Sample 15 cents; also 200 cases No. 1 comb honey. J. D. Beals, Oto, Iowa.

WANTED—To buy—Extracted honey. State price, how packed. Send sample. Harmony Bee and Honey Co., White Bear Lake, Minn.

WANTED—Light extracted honey, any amount. Send sample and best cash price f. o. b. Ft. Collins, Colo. A. A. Lyons, Ft. Collins, Colo.



**WANTED**—Honey in 10-lb cans.  
Lang, 1609 Dayton St., Chicago.

**FOR SALE**—30,000 car white extracted sweet clover honey, 18c a pound f. o. b. Basin, Wyo.  
J. N. Miakes, Box 525.

**OUR CROP OF HONEY** is now ready for shipment. It is a good grade white clover with a very small trace of basswood, almost water white. It is put up in new 60-lb. tin cans, two to the case. This honey was all produced by ourselves above queen-excluders, in nice white combs. Then combs were provided so that no honey was taken off until after the season, when it was thoroughly cured by the bees. It costs more to raise a crop of honey this way, as we do not get as much per colony, so we have to have a little more money for this fancy article than the ordinary honey on the market. Try a small order and we feel sure you will buy no other. We can furnish at the following prices, f. o. b. Northstar: one 60-lb. can \$15.50; in cases of two cans, \$30 a case, in any sized orders. The crop is short this year and will not last long at these prices. We feel quite sure that the price will not be any lower, so do not be disappointed by not ordering early if you are looking for honey as good as mine can buy.  
D. R. Townsend, Northstar, Mich.

**FOR SALE**—New crop clover extracted honey, two 60-pound cans to case, 35c per pound. Buckwheat and clover mixed, about half and half, 30c per pound.  
H. G. Quirin, Bellevue, Ohio.

**WANTED**—White clover or light extracted honey. Send sample; state how honey is put up and lowest cash price delivered at Monroe; also buy beeswax.  
E. B. Rosa, Monroe, Wis.

**WE BUY HONEY AND BEESWAX**—Give us your best price delivered New York. On comb honey state quantity, quality, size, weight per section and sections to a case. Extracted honey, quantity, quality, how packed, and send samples. Chas. Israel Bros. Co.,  
486 Canal St., New York, N. Y.

**FOR SALE**—15,000 pounds of fine clover and basswood honey. The best offer takes it if satisfactory. Chester E. Keister, Clarno, Wis.

**WANTED**—Comb, extracted honey and beeswax.  
R. A. Burnett & Co.,  
6A13t 178 S. Water St. Chicago, Ill.

**WANTED**—Shipments of old comb and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendering. Fred W. Muth Co.,  
204 Walnut St., Cincinnati, Ohio.

### FOR SALE

**FOR SALE OR TO LET**—Eastern New York farm, suitable for bees, poultry, fruit.  
G. H. Hawley, Castleton, N. Y.

**FOR SALE**—One Novice honey extractor; used but little, takes Langstroth frames; 1 Bingham uncapping knife; both for \$10. One Doolittle solar wax extractor, needs new glass, \$1. Will be shipped from Leon, Iowa.  
Edwin Bevins, Alamogordo, New Mexico.

**TO BEEKEEPERS** that ship pound packages: I am acquainted with your troubles. It's early queens you need. I can fill your orders.  
A. B. Marchant, Jesup, Ga.

**FOR SALE**—Camera, 5x7 Graphic and outfit in A1 condition. If interested in a bargain, write for detailed description and price.  
Walter Timmerman,  
2107 North Tremont St., Kansas City, Kans.

**FOR SALE**—Cedar or pine dovetailed hives; also full line of supplies, including Dadant's foundation. Write for catalog.  
A. E. Burdick, Sunnyside, Wash

**FOR SALE**—38-35 Marlin repeating rifle, \$25; excellent condition. Will trade for honey extractor; must be in good shape, not smaller than size 15.  
L. C. Johnson, Rio, Wis., R. 3.

**WANTED**—An experienced man for 1920 to work outyards for bulk comb honey. References required.  
John W. Cash, Bogart, Ga.

**FOR SALE**—"Superior" Foundation (Weed process). Quality and service unexcelled.  
Superior Honey Co., Ogden, Utah.

### WANTED

**WANTED**—Young farmer, 20, strong, energetic, educated, with some beekeeping experience, wishes to work for successful beekeeper. Southern or Western States preferred.  
Arthur Wilson, Hammond, N. Y.

**WANTED**—A Cowan reversible extractor.  
Harold Hicks, Long Lake, Mich.

**WANTED**—Small second-hand extractor in good condition and reasonable.  
W. H. Hiller, Allwau, Okla.

**WANTED**—Comb honey supers, complete; will take any style at the right price.  
O. E. Timm, Bennington, Neb.

**WANTED**—Extractor, circular saw table, shotgun, rifle, camera.  
Lorenzo Clark, Winona, Minn.

**WANTED**—10 hives of bees  
J. H. T. Meurer, Hest, Mo.

**WANTED**—Partner with cash, part or whole time, beekeeping, poultry keeping.  
Embleton, 5163 Somerville St.,  
Vancouver, B. C.

**WANTED**—100 or more colonies; also supers and equipment.  
S. S. Thorpe, Braggville, Mass.

**WANTED**—Combs that are free from disease, drawn from full sheets of foundation, on the self-spacing Jumbo frames.  
Ernest Peterson, R No. 2, Sandwich, Ill.

**WANTED**—Some bees in 10-frame hives from Oklahoma, Kansas or bordering States, to be shipped to me.  
C. M. Kell,  
1128 Idaho Ave., Chickasha, Okla.

**WANTED**—For exhibition purposes, naturally built combs, partly or fully drawn out. Such combs should not have over 25 per cent drone-comb and should be the product of the bees themselves, without use of foundation. Write us describing what you have and we will name our price on same.  
American Bee Journal, Hamilton, Ill.

**WANTED**—Your old combs, cappings or slumgum to render into beeswax by our high steam pressure wax presses.  
Dadant & Sons, Hamilton, Ill.

**WANTED**—Your order for "Superior" Foundation. Prompt shipments at right prices.  
Superior Honey Co., Ogden, Utah.

### SUPPLIES

**FOR SALE**—Comb honey supers. Don't miss your chance to buy your supers when you can get them nearly as good as new for half price of 1919 catalog.  
Mrs. Anna Josephson, Box 121, Granville, Ill.

**FOR SALE**—Brood frames, hive bodies, covers and bottoms. Write for prices and particulars. I can save you money, as we make them here, where lumber is reasonable in price.  
F. D. Bowers, Sugar Grove, Ia.

**WANTED**—Second-hand 2 or 4-frame honey extractor; 12-inch baskets, steam uncapping knife with tubing, steam generator safety valve.  
F. S. Embleton,  
5163 Somerville St., Vancouver, B. C.

**FOR SALE**—Good second-hand 60-lb cans, two to the case; used only once, 60c per case, cash with order. E. B. Rosa, Monroe, Wis.

**FOR SALE**—60 lbs cans, 2 in case, used but once, 40c a case.  
Mason, Mechanic Falls, Me.

**FOR SALE**—Selling out bee supplies at 50 per cent less than present prices. Write for list.  
Hunkel Co., Milwaukee, Wis.

**WANTED**—About 20 10-frame hives, 50 extracting supers, hand extractor and general supplies. Stanthrop Farm, Holliston, Mass.

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Tested	3.00	16.50	30.00	2.50	12.00	23.00	2.00	10.50	18.50
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## Crop and Market Report

Compiled by M. G. Dadant

The shortage of sugar still continues, and its price has risen in the larger cities as high as 20 cents retail, though there is a stabilizing of the market at or near 13 cents.

Yet, with the shortage of sugar, there is not an excessive demand for honey. In fact the price has dropped off about one cent per pound on the California market. Orange honey is being quoted at 19 cents, sage at 18 cents and sweet clover white honey at 17 to 17½ cents per pound f. o. b. California common points.

The rate of freight is lower from California east than from interior points, as Salt Lake City, Phoenix, Ariz., etc., so that the price at these points would have to be shaded a little.

There seems to be quantities of honey in the hands of the producers yet waiting disposition. Beekeepers who were holding, expecting to realize 20 cents for their honey, net, would be glad to realize 17 to 18 cents.

Probably the greatest contributing cause of this is the

lack of demand on the part of European countries. The demand from there has greatly fallen off. England is now able to import from its colonies, and large amounts are being received from Australia and New Zealand. In these countries the price of honey has ruled relatively low throughout the war, owing to lack of shipping space. Just now, we are feeling the effects of such honey competing with our higher priced products.

No doubt the prices will in time stabilize, though it is doubtful if we will, at least for some time, see honey approach the prices which have been realized by producers during the last two or three years.

Honey dealers and retailers report excellent demand for honey from the consumer, but the tendency is towards a cleaning up of all old stocks on hand before buying more. It may be possible that the price will stiffen when old stocks are exhausted and more honey is needed for filling current orders.

The larger bottlers seem to be fairly well supplied.

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Including those important to the beekeeper as sources of pollen

By FRANK C. PELLETT

This book is the result of many years of personal investigation and travel from New England to California and from Canada to Florida and Texas to secure first-hand information on the sources of nectar and pollen. It is splendidly illustrated with 156 photographs, and describes the honey plants of all parts of America. A list of the honey plants of each State is given separately and the plants described in alphabetical order.

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### OUTAPIARIES

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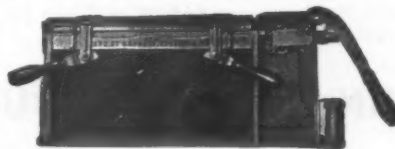
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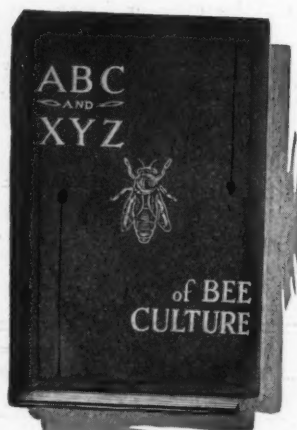


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